





















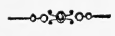
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# THE ZOOLOGICAL RECORD. <sup>20</sup>



THE object of the ZOOLOGICAL RECORD is to give, in an annual Volume, reports on, abstracts of, and an index to, the various Zoological publications which have appeared during the preceding year; to acquaint Zoologists with the progress of every branch of their science in all parts of the globe; and to form a repertory which will retain its value for the Student in future years.

The 'Zoological Record' is published for the Society by Messrs. Gurney and Jackson at the price of 30s. per volume. But all Members of the Zoological Society of London have the privilege of receiving it, including the cost of delivery (within the United Kingdom), at a subscription price of 20s. per annum. This Subscription is due on the 1st of July in every year, but the privilege of Subscription is forfeited unless the amount be paid before the 1st of December following.

The Zoological Society, having purchased the entire stock of the 'Zoological Record,' are able to supply complete sets of the first twenty-two volumes at the price of £5 10s. Volumes of any single year (exclusive of the last two volumes and Vol. 6) can likewise be supplied at 10s. per volume.

Members of the Society wishing to subscribe to the 'Record' are requested to apply at this office for a Form, to be returned when filled up and signed by the subscriber. In order to facilitate the payment of the subscription, a Banker's Order Form is also furnished to those who prefer that mode of payment. This order, when filled up and signed, should be sent to the Society's office for registration; it will then be sent to the Agents named therein.

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P. L. SCLATER,  
*Secretary.*

Oct. 1st, 1892.

ZOOLOGICAL SOCIETY OF LONDON,  
3, HANOVER SQUARE, W.

LIST OF VOLUMES  
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'ZOOLOGICAL RECORD.'

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The Record of Zoological Literature, 1864. Volume First.  
Edited by ALBERT C. L. G. GÜNTHER, M.A., M.D., Ph.D., F.Z.S.,  
&c. London, 1865. Price 10s.

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The Record of Zoological Literature, 1865. Volume Second.  
Edited by ALBERT C. L. G. GÜNTHER, M.A., M.D., Ph.D., F.Z.S.,  
&c. London, 1866. Price 10s.

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The Record of Zoological Literature, 1866. Volume Third.  
Edited by ALBERT C. L. G. GÜNTHER, M.A., M.D., Ph.D., F.R.S.,  
F.Z.S., &c. London, 1867. Price 10s.

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The Record of Zoological Literature, 1867. Volume Fourth.  
Edited by ALBERT C. L. G. GÜNTHER, M.A., M.D., Ph.D., F.R.S.,  
F.Z.S., &c. London, 1868. Price 10s.

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The Record of Zoological Literature, 1868. Volume Fifth.  
Edited by ALBERT C. L. G. GÜNTHER, M.A., M.D., Ph.D., F.R.S.,  
F.Z.S., &c. London, 1869. Price 10s.

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The Record of Zoological Literature, 1869. Volume Sixth.  
Edited by ALBERT C. L. G. GÜNTHER, M.A., M.D., Ph.D., F.R.S.,  
F.Z.S., &c. London, 1870. Price 30s.

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The Zoological Record for 1870; being Volume Seventh of the  
Record of Zoological Literature. Edited by ALFRED NEWTON, M.A.,  
F.R.S., Professor of Zoology and Comparative Anatomy in the Uni-  
versity of Cambridge, F.L.S., V.P.Z.S., &c. London, 1871. Price 10s.

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The Zoological Record for 1871; being Volume Eighth of the  
Record of Zoological Literature. Edited by ALFRED NEWTON, M.A.,  
F.R.S., Professor of Zoology and Comparative Anatomy in the Uni-  
versity of Cambridge, F.L.S., V.P.Z.S., &c. London, 1873. Price 10s.

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The Zoological Record for 1872; being Volume Ninth of the  
Record of Zoological Literature. Edited by ALFRED NEWTON, M.A.,  
F.R.S., Professor of Zoology and Comparative Anatomy in the Uni-  
versity of Cambridge, F.L.S., V.P.Z.S., &c. London, 1874. Price 10s.

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The Zoological Record for 1873; being Volume Tenth of the  
Record of Zoological Literature. Edited by EDWARD CALDWELL  
RYE, F.Z.S., Librarian to the Royal Geographical Society. London,  
1875. Price 10s.

The Zoological Record for 1874 ; being Volume Eleventh of the Record of Zoological Literature. Edited by EDWARD CALDWELL RYE, F.Z.S., M.E.S., Editor Ent. M. Mag., Librarian to the Royal Geographical Society. London, 1876. Price 10s.

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The Zoological Record for 1875 ; being Volume Twelfth of the Record of Zoological Literature. Edited by EDWARD CALDWELL RYE, F.Z.S., M.E.S., Editor Ent. M. Mag., Librarian to the Royal Geographical Society. London, 1877. Price 10s.

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The Zoological Record for 1876 ; being Volume Thirteenth of the Record of Zoological Literature. Edited by EDWARD CALDWELL RYE, F.Z.S., M.E.S., Editor Ent. M. Mag., Librarian to the Royal Geographical Society. London, 1878. Price 10s.

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The Zoological Record for 1877 ; being Volume Fourteenth of the Record of Zoological Literature. Edited by EDWARD CALDWELL RYE, F.Z.S., M.E.S., Editor Ent. M. Mag., Librarian to the Royal Geographical Society. London, 1879. Price 10s.

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The Zoological Record for 1878 ; being Volume Fifteenth of the Record of Zoological Literature. Edited by EDWARD CALDWELL RYE, F.Z.S., M.E.S., Editor Ent. M. Mag., Librarian to the Royal Geographical Society. London, 1880. Price 10s.

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The Zoological Record for 1879 ; being Volume Sixteenth of the Record of Zoological Literature. Edited by EDWARD CALDWELL RYE, F.Z.S., M.E.S., Editor Ent. M. Mag., Librarian to the Royal Geographical Society. London, 1881. Price 10s.

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The Zoological Record for 1880 ; being Volume Seventeenth of the Record of Zoological Literature. Edited by EDWARD CALDWELL RYE, F.Z.S., M.E.S., Editor Ent. M. Mag., Librarian to the Royal Geographical Society. London, 1881. Price 10s.

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The Zoological Record for 1881 ; being Volume Eighteenth of the Record of Zoological Literature. Edited by EDWARD CALDWELL RYE, F.Z.S., M.E.S., Editor Ent. M. Mag., Librarian to the Royal Geographical Society. London, 1882. Price 10s.

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The Zoological Record for 1882 ; being Volume Nineteenth of the Record of Zoological Literature. Edited by EDWARD CALDWELL RYE, F.Z.S., M.E.S., Editor Ent. M. Mag., Librarian to the Royal Geographical Society. London, 1883. Price 10s.

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The Zoological Record for 1883 ; being Volume Twentieth of the Record of Zoological Literature. Edited by EDWARD CALDWELL RYE, F.Z.S., M.E.S., Editor Ent. M. Mag., Librarian to the Royal Geographical Society. London, 1884. Price 10s.

The Zoological Record for 1884 ; being Volume the Twenty-first of the Record of Zoological Literature. Edited by F. JEFFREY BELL, M.A., Sec. R.M.S., Professor of Comparative Anatomy and Zoology in King's College, London. London, 1885. Price 10s.

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The Zoological Record for 1885 ; being Volume the Twenty-second of the Record of Zoological Literature. Edited by F. JEFFREY BELL, M.A., Sec. R.M.S., Professor of Comparative Anatomy and Zoology in King's College, London. London, 1886. Price 10s.

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The Zoological Record for 1886 ; being Volume the Twenty-third of the Record of Zoological Literature. Edited by FRANK E. BEDDARD, M.A., F.Z.S., Prosector and Davis Lecturer to the Zoological Society of London. London, 1887. Price 10s.

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The Zoological Record for 1887 ; being Volume the Twenty-fourth of the Record of Zoological Literature. Edited by FRANK E. BEDDARD, M.A., F.Z.S., Prosector and Davis Lecturer to the Zoological Society of London. London, 1888. Price 10s.

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The Zoological Record for 1888 ; being Volume the Twenty-fifth of the Record of Zoological Literature. Edited by FRANK E. BEDDARD, M.A., F.Z.S., Prosector and Davis Lecturer to the Zoological Society of London. London, 1890. Price 10s.

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The Zoological Record for 1889 ; being Volume the Twenty-sixth of the Record of Zoological Literature. Edited by FRANK E. BEDDARD, M.A., F.Z.S., Prosector and Davis Lecturer to the Zoological Society of London. London, 1890. Price 10s.

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The Zoological Record for 1890 ; being Volume the Twenty-seventh of the Record of Zoological Literature. Edited by FRANK E. BEDDARD, M.A., F.Z.S., Prosector and Davis Lecturer to the Zoological Society of London. London, 1892. Price 30s.

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The Zoological Record for 1891 ; being Volume the Twenty-eighth of the Record of Zoological Literature. Edited by DAVID SHARP, Esq., M.D., F.R.S., F.Z.S. London, 1892. Price 30s.

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THE ZOOLOGICAL RECORD.



THE  
ZOOLOGICAL RECORD,

VOLUME THE TWENTY-EIGHTH.

BEING

RECORDS OF ZOOLOGICAL LITERATURE

RELATING CHIEFLY TO THE YEAR

1891,

By J. A. THOMSON, R. LYDEKKER, R. BOWDLER SHARPE, G. A. BOULENGER, W. A. HERDMAN, B. B. WOODWARD, C. WARBURTON, R. I. POCKOCK, D. SHARP, E. A. MINCHIN, A. WILLEY, AND S. J. HICKSON.

EDITED BY

D. SHARP, M.A., F.R.S., F.Z.S., &c.,

CURATOR IN ZOOLOGY, UNIVERSITY MUSEUM OF ZOOLOGY AND COMPARATIVE ANATOMY, CAMBRIDGE.

Explorate solum : sic fit via certior



LONDON :

GURNEY & JACKSON, PATERNOSTER ROW.

M.DCCC.XCII.

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## PREFACE.

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THE twenty-eighth volume of the ZOOLOGICAL RECORD resembles its predecessors in method and arrangement. That it appears somewhat earlier than usual is due to the willing exertions of the Recorders. As they have had an unusually short period for the execution of their work, the thanks of Zoologists will no doubt be awarded to them for their efforts. Such thanks are due to all the Recorders, but more particularly to Messrs. Lydekker and Boulenger and to Dr. Bowdler Sharpe, who furnished their records very early in the present year, without, as it is believed, detriment to the completeness or to the careful execution of their work. Special thanks are also due to Mr. B. B. Woodward, who has given us an excellent record of *Mollusca* at very short notice, and under circumstances that rendered his task more than usually arduous.

An alteration has been made in the title-page in order that it may more accurately describe the contents of the volume to which it is prefixed. It is hoped that the slight difference of procedure indicated by this change will promote a more punctual appearance of the yearly volume.

Although the RECORD is published annually, and is thus, broadly speaking, a record of the Zoological Literature of one year, yet the attempt to make a volume include the whole literature of the particular year of the calendar of which it bears the number has always failed. The difficulties likely to arise from the endeavour to make one yearly volume of the RECORD accurately representative of the literature of one particular year, were foreshadowed in Dr. Günther's preface to the first volume, and have since become



insuperable, owing to the increase of Zoological Literature, and especially to the extension of its publication in distant parts of the world.

On the other hand, there can be no doubt that the attempt to make the annual volume include all the literature bearing the same date as itself, though, as we have seen, doomed to failure from the very commencement of the work, has been one of the chief causes of the delays that have occurred in the publication of several volumes; the Recorders having been tempted to defer the preparation of their records by their knowledge that the delay would enable them to include some additional literature.

It is intended in future to publish the volume in August or September, including in each special record all literature not previously dealt with that may have reached the London libraries, or the Recorder, sufficiently early to be noticed by the latter. Should circumstances render it impossible to obtain a record of any of the subjects in good time, delay will be avoided by the publication of the volume without such record. Every effort will, however, be made to avert so undesirable a proceeding; and in case of failure to do so it will be arranged that the record of the following year shall atone for the deficiency of its predecessor.

D. SHARP.

CAMBRIDGE, *Sept.* 3, 1892.

LIST OF THE ABBREVIATED TITLES  
OF THE PRINCIPAL  
JOURNALS AND OF THE TRANSACTIONS OF LEARNED  
SOCIETIES  
THAT CONTAIN ZOOLOGICAL PAPERS.

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*Abh. Ak. Berl.*—Abhandlungen der königlich Akademie der Wissenschaften zu Berlin. (Also *SB.*)

*Abh. Bayer. Ak.*—Abhandlungen der mathematisch-physikalischen Classe der k. Bayerischen Akademie der Wissenschaften (Munich). (Also *SB.*)

*Abh. Böhm. Ges.*—Abhandlungen der mathematisch-naturwissenschaftlichen Classe der k. Böhmisches Gesellschaft der Wissenschaften (Prague). (Called also *Rozpravy třídy mathematicko-přírodovědecké královské české společnosti nauk.*) (Also *SB.*)

*Abh. Ges. Götting.*—Abhandlungen der k. Gesellschaft der Wissenschaften zu Göttingen.

*Abh. Ges. Halle*—Abhandlungen der naturforschenden Gesellschaft in Halle. (Also *Ber.*)

*Abh. Ges. Isis*—Abhandlungen der naturwissenschaftlichen Gesellschaft 'Isis' in Dresden. (See *SB.*)

*Abh. Ges. Königsb.*—Abhandlungen der k. physikalisch-ökonomischen Gesellschaft in Preussen (Königsberg). (Also *SB.*)

*Abh. naturf. Ges. Görlitz*—Abhandlungen der naturforschenden Gesellschaft zu Görlitz.

*Abh. naturh. Ges. Nürnberg*—Abhandlungen der naturhistorischen Gesellschaft zu Nürnberg (Nürnberg).

*Abh. Sächs. Ges.*—Abhandlungen der k. Sächsischen Gesellschaft der Wissenschaften (Leipzig). (Also *Ber.*)

*Abh. Schw. pal. Ges.*—Abhandlungen der Schweizerischen paläontographischen Gesellschaft (Bâle).

*Abh. Senck. Ges.*—Abhandlungen herausgegeben von der Senckenbergischen naturforschenden Gesellschaft (Frankfort). (Also *Ber.*)

- Abh. Ver. Brem.*—Abhandlungen herausgegeben vom naturwissenschaftlichen Verein zu Bremen.
- Abh. Ver. Hamb.*—Abhandlungen aus dem Gebiete der Naturwissenschaften herausgegeben vom naturw. Verein in Hamburg.
- Abh. zool. Mus. Dresden*—Abhandlungen und Berichte des k. zoologischen, etc., Museums in Dresden.
- Act. Ac. Bordeaux*—Actes de l'Académie nationale des Sciences, Belles Lettres et Arts de Bordeaux.
- Act. Ac. Córdoba*—Actas de l'Academia nacional de Ciencias en Córdoba (Buenos Ayres).
- Act. Lund.*—Acta Universitatis Lundensis (Lund). (Called also *Lunds Universitets Årsskrift*.)
- Act. Soc. Fenn.*—Acta Societatis Scientiarum Fennicæ (Helsingfors).
- Act. Soc. Helv.*—Actes de la Société Helvétique des Sciences naturelles. (Called also *Verhandl. d. schweiz. Naturforsch. Gesells.*)
- Act. Soc. Jura.*—Actes de la Société Jurassienne d'Émulation.
- Act. Soc. L. Bord.*—Actes de la Société Linnéenne de Bordeaux. (Also *Comptes rendus*.)
- Act. Upsala.*—Acta Universitatis Upsalensis. (Called also *Upsala Universitets Årsskrift*.)
- Agric. Gaz. N.S.W.*—Agricultural Gazette of New South Wales (Sydney).
- Am. Geol.*—The American Geologist (Calvin et alii : Minneapolis).
- Am. J. Sci.*—American Journal of Science (New Haven).
- Am. Micr. J.*—American Monthly Microscopical Journal (Washington).
- Am. Nat.*—The American Naturalist (Philadelphia).
- Anat. Anz.*—Anatomischer Anzeiger (Bardeleben : Jena).
- An. Mus. B. Aires*—Anales del Museo nacional, Buenos Aires.
- An. Mus. Costa Rica*—Anales del Museo nacional, Republica de Costa Rica (San José).
- An. Mus. La Plata*—Anales del Museo, La Plata (Buenos Ayres).
- An. Mus. nac. Mexico*—Anales del Museo nacional de México.
- An. Soc. Arg.*—Anales de la Sociedad Científica Argentina (Buenos Aires).
- An. Soc. Esp.*—Anales de la Sociedad Española de Historia Natural (Madrid).
- Ann. Ent. Belg.*—Annales de la Société Entomologique de Belgique (Brussels).
- Ann. Fac. Marseille.*—Annales de la Faculté des Sciences de Marseille publiées sous les auspices de la municipalité (Marseille & Paris).
- Ann. Géol. univ. Paris*—Annuaire Géologique universel, Revue de Géologie et Paléontologie (Carey & Douvillè).
- Ann. Hofmuseum Wien*—Annalen des k. k. naturhistorischen Hofmuseums (von Hauer : Vienna).
- Ann. Mal.*—Annales de Malacologie (Servain : Paris).

- Ann. Micrograph.*—Annales de Micrographie spécialement consacrées à la Bactériologie aux Protophytes et aux Protozoaires (Miquel : Paris).
- Ann. Mus. Belg.*—Annales du Musée royal d'Histoire Naturelle de Belgique (Brussels).
- Ann. Mus. Genov.*—Annali del Museo civico di Storia Naturale di Genova (Genoa).
- Ann. Mus. Marseille*—Annales du Musée d'Histoire Naturelle de Marseille. Zoologie (Marion : Marseilles).
- Ann. N. H.*—Annals and Magazine of Natural History (London).
- Ann. N. York Ac.*—Annals of the New York Academy of Sciences. (Also *Trans.*)
- Ann. Queensland Mus.*—Annals of the Queensland Museum (Brisbane).
- Ann. Sci. Géol.*—Annales des Sciences Géologiques (Hébert & Milne-Edwards : Paris).
- Ann. Sci. Nat.*—Annales des Sciences Naturelles (Paris).
- Ann. Soc. Agric. Lyon*—Annales de la Société d'Agriculture, Histoire Naturelle, et Arts utiles de Lyon (Lyons & Paris).
- Ann. Soc. Belg. Micr.*—(Also *Bull. Soc. Belg. Micr.*, q.v.)
- Ann. Soc. Brux.*—Annales de la Société Scientifique de Bruxelles (Brussels).
- Ann. Soc. Char.*—Annales de la Société des Sciences Naturelles de la Charente Inférieure (= Académie de la Rochelle).
- Ann. Soc. Ent. Fr.*—Annales de la Société Entomologique de France (Paris).
- Ann. Soc. Géol. Belg.*—Annales de la Société Géologique de Belgique (Liège).
- Ann. Soc. Géol. Nord*—Annales de la Société Géologique du Nord (Lille). (Also *Mémoires.*)
- Ann. Soc. L. Lyon (n.s.)*—Annales de la Société Linnéenne de Lyon. Nouvelle série.
- Ann. Soc. Mal. Belg.*—Annales de la Société Malacologique de Belgique (Brussels).
- Ann. Univ. Lyon.*—Annales de l'université de Lyon (Paris).
- Ann. Univ. Toscane*—Annali delle Università Toscane (Pisa).
- Ant. Annual*—The Antananarivo Annual and Madagascar Magazine (Sibree : Antananarivo).
- Anz. Ak. Wien*—Anzeiger der mathematisch-naturwissenschaftlichen Classe der k. Akademie der Wissenschaften zu Wien (Vienna).
- Appalachia*—Appalachia: the Journal of the Appalachian Mountain Club (Boston).
- Arb. Inst. Würzb.*—Arbeiten aus dem zoologisch-zootomischen Institute in Würzburg.
- Arb. z. Inst. Wien*—Arbeiten aus dem zoologischen Institute der Universität Wien (Vienna).

- Arb. z. Inst. Graz*.—Arbeiten aus dem zoologischen Institute zu Graz (Leipsic).
- Arch. Anat. Phys.*—Archiv für Anatomie und Physiologie (His, Braune, & Du Bois Reymond : Leipzig).
- Arch. Biol.*—Archives de Biologie (Van Beneden & Van Bambeke : Ghent).
- Arch. d'Anthrop.*—Archives d'anthropologie (Toulouse).
- Arch. f. Anthrop.*—Archiv für Anthropologie : Zeitschrift für Naturgeschichte und Urgeschichte des Menschen (Brunswick).
- Arch. f. Math. og Naturv.*—Archiv for Mathematik og Naturvidenskab (Lie, G. O. Sars, Kristiania).
- Arch. f. Nat.*—Archiv für Naturgeschichte. Neue Folge (Berlin).
- Arch. f. Thierheilk.*—Archiv für Thierheilkunde.
- Arch. ges. Phys.*—Archiv für die gesammte Physiologie des Menschen und der Thiere (Pflüger : Bonn).
- Arch. Ital. Biol.*—Archives Italiennes de Biologie ; Revues, Résumés, Reproductions des travaux scientifiques Italiens (Emery & Mosso : Turin).
- Arch. mikr. Anat.*—Archiv für mikroskopische Anatomie (Bonn).
- Arch. Miss. Sci.*—Archives des Missions Scientifiques et Littéraires (Paris).
- Arch. Mus. Lyon*—Archives du Muséum d'Histoire Naturelle de Lyon.
- Arch. Mus. R. Jan.*—Archivos do Museu nacional do Rio de Janeiro.
- Arch. Mus. Teyl.*—Archives du Musée Teyler (Haarlem).
- Arch. Nat. Liv.*—Archiv für die Naturkunde Liv-, Ehst-, und Kurlands (Dorpat).
- Arch. naturw. Landesforsch. Böhmen*—Archiv für naturwissenschaftliche Landesdurchforschung von Böhmen (Prag).
- Arch. Néerl.*—Archives Néerlandaises des Sciences Exactes et Naturelles (Bosscha : Haarlem).
- Arch. Phys.*—Archives de Physiologie Normale et Pathologique (Brown-Séquard : Paris).
- Arch. Sci. Nat.*—Archives des Sciences Physiques et Naturelles (Geneva).
- Arch. Ver. Mecklenb.*—Archiv des Vereins der Freunde der Naturgeschichte in Mecklenburg.
- Arch. Zeeuwsch Genoots. Wetensch.*—Archief vroegere en latere Mededeelingen voornamelijk in Betrekking tot Zeeland uitgegeven door het Zeeuwsch Genootschap der Wetenschappen (Middelburg).
- Arch. Z. expér.*—Archives de Zoologie expérimentale et générale (Lacaze-Duthiers : Paris).
- Atti Acc. Gioen.*—Atti dell' Accademia Gioenia di Scienze Naturali (Catania).
- Atti Acc. Napoli*—Atti della R. Accademia delle Scienze Fisiche e Matematiche.



- Atti Acc. Palermo*—Atti della R. Accademia di Scienze, Lettere é Belle Arti di Palermo (Palermo).
- Atti Acc. Pontaniana*—Atti dell' Accademia Pontaniana (Naples).
- Atti Acc. Pontif. Lincei*—Atti dell' Accademia Pontificia de' nuovi Lincei.
- Atti Acc. Tor.*—Atti della R. Accademia delle Scienze di Torino (Turin).
- Atti Ist. Nap.*—Atti del R. Istituto d'incoraggiamento alle Scienze Naturali Economiche e Technologiche, &c., di Napoli (Naples).
- Atti Ist. Venet.*—Atti del R. Istituto Veneto di Scienze, Lettere et Arti, &c. (Venice).
- Atti [Mem. Rend.] Acc. Rom.*—Atti [Memorie : Rendiconti] della R. Accademia dei Lincei (Rome).
- Atti [Mem.] Soc. Tosc.*—Atti [Memorie] della Società Toscana di Scienze Naturali residente in Pisa.
- Atti [Rend. Mem.] Soc. Mod.*—Atti [Memorie : Rendiconti] della Società dei Naturalisti di Modena.
- Atti Soc. Ital.*—Atti della Società Italiana di Scienze Naturali (Milan).
- Atti Soc. Ligust.*—Atti della Società Ligustica di scienze naturali e geografiche (Genova).
- Atti Soc. Ven.-Trent.*—Atti della Società Veneto-Trentina di Scienze Naturali residente in Padova (Padua). (Also *Bull.*)
- Atti Univ. Genova*—Atti della R. Università di Genova.
- Auk*—The Auk. A Quarterly Journal of Ornithology. (Continuation of the *Bulletin of the Nuttall Ornithological Club.*)
- Ausland*—Das Ausland (Stuttgart).
- Beitr. Morphol. Morphog.*—Beiträge zur Morphologie und Morphogenie (Gerlach : Stuttgart).
- Beitr. Pal. Oesterr.-Ung.* — Beiträge zur Paläontologie Oesterreich-Ungarn's und des Orients (Mojsisovics & Neumayr : Vienna).
- Beitr. Russ. Reiches* (2)—Beiträge zur Kenntniss des Russischen Reiches und der angrenzenden Länder Asiens. Neue Folge (Schrenck & Maximowics : St. Petersburg).
- Ber. deuts. botan. Ges.*—Bericht der deutschen botanischen Gesellschaft (Berlin).
- Ber. Ges. Freiburg*—Berichte der naturforschenden Gesellschaft zu Freiburg (Freiburg, i Br.).
- Bergens Mus. Aarsber.*—Bergens Museum Aarsberetning (Bergen).
- Ber. Ges. Chemn.*—Bericht der naturwissenschaftlichen Gesellschaft zu Chemnitz.
- Ber. Ges. Halle*—Bericht über die Sitzungen der naturforschenden Gesellschaft zu Halle. (Also *Abhandl.*)
- Ber. Ges. Hanau* = *JB. wetter. Ges.*
- Ber. Komm. wiss. Unters. deutsch. Meere*—Bericht der Kommission zur Untersuchung der deutschen Meere.

- Ber. Naturf. Ärzte*—Ämtliche Bericht deutscher Naturforscher und Ärzte.
- Ber. naturf. Ges. Bamberg*—Bericht der naturforschenden Gesellschaft in Bamberg.
- Ber. naturhist. Mus. Hamburg*—Bericht des naturhistorischen Museums in Hamburg.
- Ber. natur. Ver. Passau*—Bericht des naturhistorischen Vereins in Passau.
- Ber. naturw. Ver. Regensburg*—Bericht der naturwissenschaftlichen Vereins in Regensburg. (Formerly *CB.*).
- Ber. Oberhess. Ges.*—Bericht der Oberhessischen Gesellschaft für Natur- und Heilkunde (Giessen).
- Ber. Offenb. Ver.*—Bericht über die Thätigkeit des Offenbacher Vereins für Naturkunde (Offenbach-on-the-Main).
- Ber. Sächs. Ges.*—Bericht ueber die Verhandlungen der königlichen Sächs. Gesellschaft der Wissenschaft in Leipzig. (Also *Abhandl.*)
- Ber. Senck. Ges.*—Bericht der Senckenbergische naturforschende Gesellschaft im Frankfurt am Main. (Also *Abhandl.*)
- Ber. St. Gall. Ges.*—Bericht über die Thätigkeit der St. Gallischen naturwissenschaftlichen Gesellschaft (St. Gallen).
- Ber. Ver. Cassel*—Berichte des Vereins für Naturkunde zu Cassel.
- Ber. Ver. Pass.*—Bericht der naturwissenschaftlichen Vereins in Passau.
- Ber. Ver. Schwaben*—Bericht der naturwissenschaftlichen Vereins für Schwaben und Neuburg (a. V.), früher naturhistorischen Vereins Augsburg (Augsburg).
- Berl. Monats.*—Berliner Monatshefte.
- B. E. Z.*—Berliner Entomologische Zeitschrift.
- Bibl. haut. études.*—Bibliothèque de l'école des hautes études. Section des Sciences Naturelles (Paris).
- Bibl. univ.*—Bibliothèque universelle et Revue Suisse (Geneva). (See *Arch. Sci. Nat.*)
- Bibl. Zool.*—Bibliotheca Zoologica (Leipsic).
- Bidr. Finl. Nat.*—Bidrag till Kännedom af Finlands Natur och Folk (Helsingfors).
- Bih. Sv. Ak. Handl.*—Bihang till K. Svenska Vetenskaps-Akademiens Handlingar (Stockholm).
- Bijdr. Dierk.*—Bijdragen tot de Dierkunde (Amsterdam).
- Biol. Centralbl.*—Biologisches Centralblatt (Rosenthal : Erlangen).
- Biol. Centr. Am.*—Biologia Centrali Americana (Godman & Salvin : London).
- Biol. Fören.*—Biologiska Föreningens Förhandlingar. Verhandlungen des biologischen Vereins in Stockholm. (Figerstedt : Stockholm.)
- Bol. Ac. Arg.*—Boletín de la Academia nacional de Ciencias de la Republica Argentina (Cordoba).

- Bol. geol. S. Paulo*—Boletim da Comissão geographica e geologica da Provincia de S. Paulo.
- Bol. Mus. la Plata*—Boletin del Museo la Plata (Buenos Ayres).
- Bol. Com. Geol.*—Bollettino del R. Comitato Geologico d'Italia (Roma).
- Boll. Mus. Zool. Anat. Comp. Torino*—Bollettino dei Musei di Zoologia ed Anatomia comparata della R. Università di Torino.
- Boll. Nat.*—Now *Riv. Ital. Sci. Nat.*
- Boll. scient.*—Bollettino scientifico (Maggi, Zoja, & Giovanni : Pavia).
- Boll. Soc. Adr.*—Bollettino della Società Adriatica di Scienze de Naturali (Trieste).
- Boll. Soc. geol. Ital.*—Bollettino della Società geologica Italiana (Rome).
- Boll. Soc. Nat. Napoli*—Bollettino della Società di Naturalisti in Napoli. (Formerly Rivista italiana di scienze naturali [Circolo degli aspiranti naturalisti].)
- Bot. Z.*—Botanische Zeitung (Halle).
- Brit. Nat.*—The British Naturalist (Robson : London).
- Bull. Ac. Belg.*—Bulletin de l'Académie royale des Sciences, des Lettres, et des Beaux Arts de Belgique (Brussels). (Also *Mem.*)
- Bull. Ac. Cracovie*—Bulletin international de l'Académie des sciences de Cracovie (Cracovie).
- Bull. Ac. Hippone*—Bulletin de l'Académie d'Hippone (Bône).
- Bull. Am. Mus. Nat. Hist.*—Bulletin of the American Museum of Natural History (New York).
- Bull. Brookville Soc.*—Bulletin of the Brookville Society of Natural History (Brookville, Indiana, U.S.A.).
- Bull. Buff. Soc.*—Bulletin of the Buffalo Society of Natural Sciences.
- Bull. Bussey Inst.*—Bulletin of the Bussey Institution (Boston).
- Bull. Cornell Univ.*—Bulletin of the Cornell University. (Ithaca.)
- Bull. Denison Univ.*—Bulletin of the Scientific Laboratories of Denison Universities (Granville, Ohio).
- Bull. Dep. Agric. Ent.*—U.S. Department of Agriculture. Division of Entomology. Bulletin (Washington).
- Bull. Ent. Ital.*—Bollettino della Società Entomologica Italiana (Florence).
- Bull. Ess. Inst.*—Bulletin of the Essex Institute (Salem, U.S.A.).
- Bull. Geol. Soc. Amer.*—Bulletin of the Geological Society of America (New York).
- Bull. Illin. Lab. N. H.*—Bulletin of the Illinois State Laboratory of Natural History. (Champaign, Illinois.)
- Bull. Inst. Nat. Genevois*—Bulletin de l'Institut nationale Genevois.
- Bull. Lab. Iowa*—Bulletin from the Laboratories of Natural History of the State University of Iowa (Iowa city).
- Bull. Minnesota Acad.*—Bulletin of the Minnesota Academy of Natural Sciences.

- Bull. Mosc.*—Bulletin de la Société impériale des Naturalistes de Moscou (Menzbier, Moscow).
- Bull. Mus. Belg.*—Bulletin du Musée royal d'Histoire Naturelle de Belgique (Brussels).
- Bull. Mus. C. Z.*—Bulletin of the Museum of Comparative Zoology of Harvard College (Cambridge, U.S.A.).
- Bull. Nat. Hist. Soc. New Brunswick*—Bulletin of the Natural History Society of New Brunswick (St. John's, N.B.).
- Bull. New York Mus. Nat. Hist.*—Bulletin of the New York State Museum of Natural History (Albany).
- Bull. Ohio Exp. Station*—Bulletin of the Ohio Agricultural Experiment Station, Technical Series (Columbus).
- Bull. Pétersb.*—Bulletin de l'Académie impériale des Sciences de St. Pétersbourg.
- Bull. Phil. Soc. Wash.*—Bulletin of the Philosophical Society of Washington.
- Bull. Sci. Fr. Belg.*—Bulletin Scientifique de la France et de la Belgique (Giard : Paris).
- Bull. Soc. Ac. Brest*—Bulletin de la Société Académique de Brest.
- Bull. Soc. Acclim.*—Bulletin mensuel de la Société nationale d'Acclimation de Paris (Paris).
- Bull. Soc. Angers*—Bulletin de la Société d'Études scientifiques d'Angers (Angers).
- Bull. Soc. Anthropol. Lyon*—Bulletin de la Société d'Anthropologie de Lyon.
- Bull. Soc. Anthropol. Paris*—Bulletin de la Société d'Anthropologie de Paris.
- Bull. Soc. Aude*—Bulletin de la Société d'Études scientifiques de l'Aude (Carcassonne).
- Bull. Soc. Autun*—Société d'Histoire Naturelle d'Autun.
- Bull. Soc. Belg. Micr.*—Bulletin de la Société Belge de Microscopie (Brussels). (Also *Annales*.)
- Bull. Soc. Béziers*—Bulletin de la Société d'Étude des Sciences Naturelles de Béziers. Comptes rendus des Séances (Béziers).
- Bull. Soc. Borda-Dax*—Bulletin de la Société de Borda (Dax).
- Bull. Soc. Colm.*—Bulletin de la Société d'Histoire Naturelle de Colmar.
- Bull. Soc. d'Elbeuf*—Bulletin de la Société d'étude des sciences naturelles d'Elbeuf.
- Bull. Soc. Dinan.*—Bulletin de la Société des Naturalistes Dinantais (Dinant).
- Bull. Soc. Ent. Suisse*—See *MT. Schw. ent. Ges.*
- Bull. Soc. Ent. Fr.*—Bulletin des séances de la Société Entomologique de France (Paris). (See *Ann.*.)
- Bull. Soc. Finistère*—Bulletin de la Société d'Études scientifiques du Finistère (Morlaix).

- Bull. Soc. Geogr.*—Bulletin de la Société de Géographie (Paris).
- Bull. Soc. Géol.*—Bulletin de la Société Géologique de France (Paris).
- Bull. Soc. Isère*—Bulletin de la Société de statistique des sciences naturelles et des arts industriels du département de l'Isère (Grenoble).
- Bull. Soc. L. Bruxelles*—Bulletin de la Société royale Linnéenne de Bruxelles.
- Bull. Soc. L. Nord France*—Bulletin de la Société Linnéenne du Nord de la France (Amiens).
- Bull. Soc. L. Norm.*—Bulletin de la Société Linnéenne de Normandie (Caen).
- Bull. Soc. Mal. Fr.*—Bulletin de la Société Malacologique de France (Paris).
- Bull. Soc. Mal. Ital.*—Buletino della Società Malacologica Italiana (Pisa).
- Bull. Soc. Metz*—Bulletin de la Société d'Histoire Naturelle de Metz (formerly du Département de la Moselle).
- Bull. Soc. Murith.*—Bulletin des travaux de la Société Murithienne du Valais (Neuchâtel).
- Bull. Soc. Nancy*—Bulletin de la Société des Sciences de Nancy (Paris).
- Bull. Soc. Neuchatel*—Bulletin de la Société des Sciences Naturelles de Neuchatel.
- Bull. Soc. Nimes*—Bulletin de la Société d'étude des sciences naturelles de Nimes (Nimes).
- Bull. Soc. ouest. France*—Bulletin de la Société des sciences naturelles de l'ouest de la France (Paris).
- Bull. Soc. Philom.*—Bulletin de la Société Philomathique de Paris.
- Bull. Soc. Rouen*—Bulletin de la Société des Amis des Sciences Naturelles de Rouen (Rouen).
- Bull. Soc. Saone*—Bulletins de la Société des Sciences Naturelles de Saone-et-Loire (Chalons sur Saone.) (Also *Mem.*)
- Bull. Soc. Savoie*—Bulletin de la Société d'Histoire Naturelle de Savoie (Chambéry).
- Bull. Soc. Sci. Nat. Ouest France*—Bulletin de la Société des Sciences Naturelles de l'Ouest de la France (Nantés).
- Bull. Soc. Sci. Phys. Nat. Toulouse*—Bulletin de la Société des Sciences Physiques et Naturelles de Toulouse (Toulouse).
- Bull. Soc. Stat. Isère*—Bulletin de la Société de Statistique des Sciences Naturelles, &c., du Département de l'Isère (Grenoble).
- Bull. Soc. Toulouse*—Bulletin de la Société d'Histoire Naturelle de Toulouse.
- Bull. Soc. Vaud.*—Bulletin de la Société Vaudoise des Sciences Naturelles (Lausanne).
- Bull. Soc. Ven.-Trent.*—Buletino della Società Veneto-Trentina di Scienze Naturali (Padua). (Also *Atti.*)

- Bull. Soc. Yonne*.—Bulletin de la Société des Sciences Historiques et Naturelles de l'Yonne (Auxerre).
- Bull. Soc. Z. Fr.*.—Bulletin de la Société Zoologique de France (Paris).
- Bull. U. S. Fish Comm.*.—Bulletin of the United States Fish Commission (Washington).
- Bull. U. S. Geol. Surv.*.—Bulletin of the United States Geological Survey (Washington).
- Bull. U. S. Nat. Mus.*.—Bulletin of the United States National Museum (Washington). (Also *Proceedings*.)
- Bull. Washb. Coll.*.—Bulletin of the Washburn Laboratory of Natural History (Topeka, Kansas).
- Canad. Ent.*.—Canadian Entomologist (Saunders : Montreal).
- Can. Rec.*.—Canadian Record of Science.
- Cardiff Nat. Soc.*.—Cardiff Naturalists' Society. Report and Transactions (Cardiff).
- CB. Bakt. Parasit.*.—Centralblatt für Bakteriologie und Parasitenkunde (Uhlworn : Cassel).
- CB. Ges. Anthropol.*.—Correspondenzblatt der deutschen Gesellschaft für Anthropologie, &c. (Brunswick).
- CB. Iris*.—Correspondenz-Blatt des entomologischen Vereins Iris zu Dresden.
- CB. med. Wiss.*.—Centralblatt für die medicinischen Wissenschaften (Berlin).
- CB. Ver. Regensb.*.—(Now *Ber.*)
- CB. Ver. Rheint.*.—Correspondenz-Blatt des naturhistorischen Vereins der preussischen Rheinlande und Westphalens (Bonn). (Also *Verh. & SB.*)
- CB. Ver. Riga*.—Correspondenzblatt des Naturforscher-Vereins zu Riga.
- Cellule*.—La Cellule. Recueil de Cytologie et d'Histologie Générale (Carnoy, Gilson, & Denys : Lierre & Gand).
- Circ. deutsch. Fisch. Ver.*.—Circulars des deutschen Fischerei-Vereins (Berlin).
- Comm. Ateneo Brescia*.—Commentari dell' Ateneo di Brescia.
- Conch. Mittheil.*.—Conchologische Mittheilungen (Martens : Cassel).
- Contr. E. M. Mus. Geol. Princeton*.—Contributions from the E. M. Museum of Geology, Princeton College, U.S.A. (Scott & Osborn).
- C.R.*.—Comptes rendus des Séances hebdomadaires de l'Académie des Sciences (Paris).
- C.R. Ass. Fr. Sci.*.—Compte-rendu de l'Association Française pour l'avancement des Sciences.
- C.R. Ent. Belg.*.—Comptes rendus des Séances de la Société Entomologique de Belgique (Brussels).

*C R. Soc. Biol.*—Comptes rendus hebdomadaires des Séances et Mémoires de la Société de Biologie (Paris).

*C.R. Soc. L. Bord.*—Comptes Rendus de la Société Linnéenne de Bordeaux. (Also *Actes*.)

*Dan. Selsk. Skr.*—K. Danske Videnskabernes Selskabs Skrifter (Copenhagen).

*Denk. Ak. Wien*—Denkschriften der k. Akademie der Wissenschaften zu Wien (Vienna). (Also *SB*.)

*Deutsche e. Z.*—Deutsche entomologische Zeitschrift (Kratz : Berlin).

*E. Mus. Lund.*—E museo Lundii En Samling Af Afhandlinger (Lütken : Kjøbenhavn).

*Ent.*—The Entomologist (London).

*Ent. Am.*—Entomologica Americana (Brooklyn).

*Ent. Gen.*—L'Entomologiste Genevois. Journal mensuel d'Entomologie pure et appliquée (Geneva).

*Ent. M. M.*—The Entomologist's Monthly Magazine (London).

*Ent. Med.*—Entomologiske Meddelelser udgivne af Entomologisk Forening ved Fr. Meinert Copenhagen.

*Ent. Nachr.*—Entomologische Nachrichten (Karsch : Berlin).

*Ent. Tidskr.*—Entomologisk Tidskrift, på föranstaltande af Entomologiska Föreningen i Stockholm (Spångberg : Stockholm).

*Ért. Term. Kör.*—Értekezések a természettudományok köréből, Magyar tudományos Akadémia [Memoirs on Natural Science, Hungarian Academy of Sciences] (Budapesth).

*Ess. Nat.*—Essex Naturalist : being the Journal, Transactions, and Proceeding of the Essex Field Club (Buckhurst Hill).

*Études d'Ent.*—Études d'Entomologie, Faunes Entomologiques, Descriptions d'Insectes nouveaux ou peu connus (C. Oberthür : Rennes).

*Evkön. Erd. Muz.*—Evkönyvek erdéli muzeumegylet (Kolozsvár = Klausenberg).

*Fauna*—Fauna. Comptes rendus des Sciences de la Société de Naturalistes Luxembourgeois.

*Feuill. Nat.*—Feuille des Jeunes Naturalistes (Dollfus : Paris).

*Field*—The Field (London).

*Field Club.*—The Field Club, with which is incorporated The Garner (London).

*For. & Str.*—Forest and Stream.

*Forh. Selsk. Chr.*—Forhandlingar i Videnskabs-Selskabet i Christiania.

*Förh. Sk. Naturf.*—Förhandlingar vid de Skandinaviska Naturforskarnes.

*Garner*—The Garner, &c. (now Field Club, *q.v.*).

*Gef. Welt*.—Die gefiederte Welt: Zeitschrift für Vogelliebhaber, -zuchter und -händler (Russ: Berlin).

*Geol. Mag.*—Geological Magazine (Woodward: London).

*Giorn. Sci. Palerm.*—Giornale di Scienze Naturali ed Economiche di Palermo.

*Göteborgs Handl.*—Göteborgs kongl. Vetenskaps och Vitterhets samhälles Handlingar.

*Helios*.—See *Mon. MT. Ver. Naturw. Frankfurt-a-O.*

*Hist. Berwick Nat. Club*.—History of the Berwickshire Naturalists' Club (Alnwick).

*Hor. Ent. Ross.*—Horæ Societatis Entomologicæ Rossicæ (St. Petersburg).

*Humming bird*.—The Humming bird (Boucard: London).

*Ibis*.—The Ibis (Sclater: London).

*Ind. Mus. Notes*.—Indian Museum Notes (Calcutta).

*Ins. Life*.—Insect Life (Washington).

*Int. J. Micr.*—The International Journal of Microscopy & Natural Science (Allen & Spiers: London & New York).

*Izvest. Mosc. Univ.*—Izvestiya imperatorskova obshchestva lyubiteli Estestvoznaiiya, Antropologi i Etnografii Sostoyashova, pre Moskovskom Universitet.

*J. Ac. Philad.*—Journal of the Academy of Natural Sciences of Philadelphia.

*J. Agric. Soc. India*.—Journal of the Agricultural and Horticultural Society of India (Calcutta).

*J. Anat. Phys.*—Journal of Anatomy and Physiology (London).

*J. A. S. B.*—Journal of the Asiatic Society of Bengal (Calcutta).

*J. A. S. (Bombay)*.—Journal of the Bombay Branch of the Royal Asiatic Society.

*J. A. S. (Ceylon)*.—Journal of the Ceylon Branch of the Royal Asiatic Society.

*J. A. S. (China)*.—Journal of the China Branch of the Royal Asiatic Society.

*J. A. S. (Straits)*.—Journal of the Straits Branch of the Royal Asiatic Society (Singapore).

*JB. Ak. Amst.*.—Jaarboek van de k. Akademie van Wetenschappen (Amsterdam). (Also *Verhandl.*)

*JB. Mijnwezen*.—Jaarboek van het Mijnwezen in Nederlandsch Oost-Indië (Amsterdam).

*JB. geol. Reichsanst.*.—Jahrbuch der k.-k. geologischen Reichsanstalt (Vienna). (Also *Verhandl.*)

*JB. Hamb.*.—Jahrbuch der Hamburgischen wissenschaftlichen Anstalten.



- JB. Karpath. Ver.*—Jahrbuch des Ungarischen Karpathen-Vereins (Kés-  
mark).
- JB. k. Akad. Erfurt*—Jahrbücher der königlichen Akademie gemeinnüt-  
ziger Wissenschaften zu Erfurt.
- JB. k. preuss. geol. Landesanst.*—Jahrbuch der königlich preussischen  
geologischen Landesanstalt und Bergakademie zu Berlin.
- JB. mal. Ges.*—Jahrbuch der deutschen malakozoologischen Gesellschaft  
(Kobelt : Frankfurt).
- JB. Mineral.*—Neues Jahrbuch für Mineralogie, Geologie, und Paläon-  
tologie (Leonard & Geinitz : Leipzig).
- JB. Mijnwezen Nederl. Indie*—Jaarboek van het Mijnwezen van Nederl.  
Oost Indie (Amsterdam).
- JB. Mus. Kärnt.*—Jahrbuch des naturhistorischen Landesmuseums von  
Kärnthen (Klagenfurt).
- JB. nass. Ver.*—Jahrbuch des nassauischen Vereins für Naturkunde  
(Wiesbaden).
- JB. Sieb. Karpath. Ver.*—Jahrbuch des Siebenbürgischen Karpathen-  
Vereins (Hermannstadt).
- Jahresber. först.-phän. Stat.*—Jahresbericht der fürstlich-phänologischen  
Stationen Deutschlands (Berlin).
- J. Ber. Annab. Ver.*—Jahresbericht des Annaberg-Buchholzer Vereins für  
Naturkunde (Annaberg).
- J. Ber. Ges. Graub.*—Jahresbericht der naturforschenden Gesellschaft  
Graubündens (Chur).
- J. Ber. Ges. Hannov.*—Jahresbericht der naturforschenden Gesellschaft in  
Hannover.
- J. Ber. k. Böhm. Ges. Wiss.*—Jahresbericht der königlich Böhmischem  
Gesellschaft der Wissenschaften.
- J. Ber. Pollichia*—Jahresbericht der Pollichia eines naturwissenschaft-  
lichen Vereins der Rheinpfalz (Dürkheim a. d. Hart).
- J. Ber. Schles. Ges.*—Jahresbericht der Schlesischen Gesellschaft für vater-  
ländische Cultur (Breslau). (Also *Abhandl.*)
- J. Ber. Ver. Braunschw.*—Jahresbericht des Vereins für Naturwissen-  
schaft zu Braunschweig (Brunswick).
- J. Ber. Ver. Frankfurt*—Jahresbericht des physikalischen Vereins zu  
Frankfurt-am-Main.
- J. Ber. Ver. Magdeburg*—Jahresbericht und Abhandlungen des natur-  
wissenschaftlichen Vereins in Magdeburg.
- J. Ber. Ver. Osnabr.*—Jahresbericht des naturwissenschaftlichen Vereins  
zu Osnabrück.
- J. Ber. Ver. Zwickau*—Jahresbericht des Vereins für Naturkunde zu  
Zwickau.
- J. Ber. Westf. Ver.*—Jahresbericht der zoologischen Sektion des Westfäl-  
ischen provincial-Vereins für Wissenschaft und Kunst (Münster).
- J. Bomb. N. H. Soc.*—The Journal of the Bombay Natural History Society  
(Phipson : Bombay).

- J. Brit. Dent. Ass.*—Journal of the British Dental Association (London).
- J. Cincinn. Soc.*—Journal of the Cincinnati Society of Natural History.
- J. Coll. Sci. Japan*—Journal of the College of Science, Imperial University, Japan (Tôkyô).
- J. de Conch.*—Journal de Conchyliologie (Crosse & Fischer : Paris).
- J. de l'Anat. Phys.*—Journal de l'Anatomie et de la Physiologie (Pouchet : Paris).
- J. Elisha Mitchell Sci. Soc.*—Journal of the Elisha Mitchell Scientific Society (Raleigh, N.C.).
- Jen. Z. Nat.*—Jenaische Zeitschrift für Naturwissenschaft, herausgegeben von der medicinisch-naturwissenschaftlichen Gesellschaft zu Jena.
- J. f. O.*—Journal für Ornithologie (Cabanis : Leipzig).
- JH. Ver. Lüneb.*—Jahreshefte des naturwissenschaftlichen Vereins für das Fürstenthum Lüneburg.
- JH. Ver. Württ.*—Jahreshefte des Vereins für vaterländische Naturkunde in Württemberg (Stuttgart).
- J. Inst. Jamaica*—Journal of the Institute of Jamaica (Kingston).
- J. L. S.*—Journal of the Linnean Society ; Zoology (London).
- J. London Coll. Soc.*—Journal of the City of London College Society, London (Lewes).
- J. Mar. Biol. Ass.*—Journal of the Marine Biological Association (London & Plymouth).
- J. Morph.*—Journal of Morphology (Whitman & Allis : Boston, U.S.A.).
- J. Microgr.*—Journal de Micrographie (Pellétan : Paris).
- J. New Jersey N. H. Soc.*—Journal of the New Jersey Natural History Society (Trenton). (Formerly *J. Trenton Soc.*)
- J. Northampt. Soc.*—Journal of the Northamptonshire Natural History Society and Field Club.
- J. N. Y. Micr. Soc.*—Journal of the New York Microscopical Society (New York).
- J. of Conch.*—Journal [formerly Quarterly Journal] of Conchology (London).
- Johns Hopk. Univ. Circ.*—Johns Hopkins University Circulars (Baltimore).
- J. Physiol.*—The Journal of Physiology (Foster et alii : Cambridge).
- J. Quek. Club*—Journal of the Quekett Microscopical Club (London).
- J. R. Agric. Soc.*—Journal of the Royal Agricultural Society (London).
- J. R. Inst. Cornwall*—Journal of the Royal Institution of Cornwall (Truro).
- J. R. Micr. Soc.*—Journal of the Royal Microscopical Society (London).
- J. R. Geol. Soc. Ireland*—Journal of the Royal Geological Society of Ireland (London, Dublin, & Edinburgh).

- J. R. Soc. N. S. W.*—Journal and Proceedings of the Royal Society of New South Wales (Sydney).
- J. Sci. Lisb.*—Jornal de Sciencias, &c., da Academia de Lisboa (Lisbon).
- J. Tr. Vict. Inst.*—Journal of the Transactions of the Victoria Institutè, or Philosophical Society of Great Britain (London).
- Kansas Nat.*—The Kansas City Naturalist (Kansas). (Formerly *The Hosier Naturalist*).
- Kosmos Lemberg*—Kosmos : Lemberg.
- L'Ab.*—L'Abeille (De Marseul : Paris).
- La Nature*—La Nature, Revue des Sciences, &c. (Tissandier : Paris).
- Le Nat.*—Le Naturaliste (Deyrolle : Paris).
- Leopoldina*—Leopoldina: Ämtlichen Organ für der k. Leopold-Carol. deutsch. Acad.
- Lioar Man.*—Yn Lioar Manninagh. Published quarterly, for The Isle of Man Natural History and Antiquarian Society (Kermode : Ramsey).
- Lotos*—Lotos, Jahrbuch für Naturwissenschaft im Auftrage des Vereines 'Lotos' (Prague).
- Maandbl. Natuurw.*—Maandblad voor Naturwetenschappen (Amsterdam).
- Mal. Bl.*—Malakozologische Blätter (Clessin : Cassel).
- Math. Nat. Ber. Ung.*—Mathematische und naturwissenschaftliche Berichte aus Ungarn. Mit Unterstützung der Ungarischen Akad. d. Wiss. und der K. Ungar. naturwiss. Ges. herausgegeben von Baron R. Eötvös, &c. (Fröhlich : Buda-Pest).
- Math. term. Értes.*—Mathematikai és természettudományi Értesítő (Gyula : Buda Pesth).
- Math. term. köz.*—Mathematikai és természettudományi közlemények (Buda-Pest).
- Med. Nat.*—The Mediterranean Naturalist (Cooke : Malta).
- Med. Soc. Fenn.*—Meddelanden af Societas pro Fauna et Flora Fennica (Helsingfors).
- Mél. biol.*—Mélanges biologiques tirés du Bulletin de l'Académie impériale des Sciences de St. Petersburg.
- Mem. Ac. Barcel.*—Memorias de la real Academia de Ciencias de Barcelona.
- Mém. Ac. Belg.*—Mémoires de l'Académie royale des Sciences, des Lettres, et des Beaux Arts de Belgique (Brussels). (Also *Bull.*)
- Mem. Acc. Bologn.*—Memorie della R. Accademia delle Scienze dell Istituto di Bologna.

- Mém. Ac. Dijon*—Mémoires de l'Académie des Sciences, Arts, et Belles-Lettres de Dijon.
- Mém. Ac. Lyon*—Mémoires de l'Académie des Sciences, Belles-Lettres et Arts de Lyon (Lyon).
- Mem. Ac. Madrid*—Memorias de la real Academia de Ciencias Exactas Físicas, y Naturales de Madrid (Madrid).
- Mem. Acc. Mod.*—Memorie delle R. Accademia di Scienze, Lettere, ed Arti in Modena.
- Mém. Ac. Montp.*—Mémoires de la Section des Sciences de l'Académie des Sciences et Lettres de Montpellier.
- Mém. Ac. Pétersb.* (7)—Mémoires de l'Académie impériale des Sciences de St. Pétersbourg. 7me série.
- Mém. Ac. Savoie*—Mémoires de l'Académie des Sciences, Belles-Lettres, et Arts de Savoie (Chambéry). (Also *Comptes Rendus*.)
- Mém. Ac. Sci.*—Mémoires de l'Académie des Sciences (Paris).
- Mem. Ac. Sci. Lisboa*—Memorias da Academia real das Sciencias de Lisboa.
- Mem. Acc. Tor.*—Memorie della R. Accademia delle Scienze di Torino (Turin).
- Mém. Ac. Toulouse*—Mémoires de l'Académie des Sciences, &c., de Toulouse.
- Mém. Ac. Vauchuse*—Mémoires de l'Académie de Vauchuse (Avignon).
- Mem. Am. Ac.*—Memoirs of the American Academy of Arts and Sciences (Cambridge). (Also *Proceedings*.)
- Mem. Boll. Soc. Geogr. Ital.*—Memorie (Bollettino) della Società Geografica Italiana (Rome).
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- Mém. Cour. Ac. Belg.* 4to.—Mémoires Couronnés et Mémoires des Savants Étrangers publiés par l'Académie Royale des Sciences, des Lettres et des Beaux Arts de Belgique.
- Mém. Cour. Ac. Belg.* 8vo.—*Ibid.* 8vo.
- Mém. Inst. Génév.*—Mémoires de l'Institut national Genévois (Geneva).
- Mem. Ist. Lomb.*—Memorie del R. Istituto Lombardo di Scienze e Lettere (Milan).
- Mem. Ist. Venet.*—Memorie del R. Istituto Veneto di Scienze, &c. (Venice).
- Mém. Liège*—Mémoires de la Société royale des Sciences de Liège.
- Mem. Mus. C. Z.*—Memoirs of the Museum of Comparative Zoology at Harvard College (Cambridge, U.S.A.).
- Mem. Nat. Ac. Sci.*—Memoirs of the National Academy of Sciences (Washington).
- Mém.-prés. Ac. Sci.*—Mémoires présentés par divers savants a l'Académie des Sciences de l'Institut de France (Paris).

- Mém. Soc. Biol.*—(See *C.R.*)
- Mém. Soc. Bord.*—Mémoires de la Société des Sciences Physiques et Naturelles de Bordeaux.
- Mém. Soc. Cannes*—Mémoires de la Société des Sciences Naturelles et Historiques des Lettres et des Beaux-Arts de Cannes et de l'Arrondissement de Grasse (Cannes).
- Mém. Soc. Cherb.*—Mémoires de la Société nationale des Sciences Naturelles et Mathématiques de Cherbourg.
- Mém. Soc. Géol.*—Mémoires de la Société Géologique de France (Paris).
- Mém. Soc. Hainault*—Mémoires et publications de la Société des Sciences, des Arts, et des Lettres du Hainault (Mons).
- Mém. Soc. Lille*—Mémoires de la Société de l'Agriculture et des Arts de Lille.
- Mém. Soc. L. N. Fr.*—Mémoires de la Société Linnéenne du Nord de la France (Amiens).
- Mém. Soc. Maine et Loire*—Mémoires de la Société académique de Maine et Loire (Angers).
- Mem. Soc. Manch.*—Memoirs and Proceedings of the Manchester Literary and Philosophical Society (London).
- Mém. Soc. Oise*—Mémoires de la Société académique d'Archéolo des Sciences et Arts du département de l'Oise.
- Mém. Soc. Phys. Genève*—Mémoires de la Société de Physique et d'Histoire Naturelle de Genève.
- Mém. Soc. Saône*—Mémoires de la Société des Sciences Naturelles de Saône-et-Loire (Chalon-sur-Saône). (Also *Bulletin*.)
- Mém. Soc. Seine & Oise*—Mémoires de la Société des Sciences Naturelles et Médicales de Seine-et-Oise (Versailles).
- Mém. Soc. Zool.*—Mémoires de la Société Zoologique de France (Paris).
- Mid. Nat.*—The Midland Naturalist (Badger & Hillhouse: London & Birmingham).
- Monit. Zool. Ital.*—Monitore Zoologico Italiano (Chiarugi & Ficalbi: Florence.)
- Month. Int. J. Anat. Hist.*—Monthly International Journal of Anatomy and Histology (Paris, Leipsic, London).
- Morph. JB.*—Morphologisches Jahrbuch: eine Zeitschrift für Anatomie und Entwicklungsgeschichte (Gegenbaur: Leipzig).
- MT. Aargau. nat. Ges.*—Mittheilungen der Aargauischen naturforschenden Gesellschaft.
- MT. embr. Inst. Wien (n.s.)*—Mittheilungen aus dem embryologischen Institute der k. k. Universität in Wien. New series (Schenck: Vienna).
- MT. Ges. Bern*—Mittheilungen der naturforschenden Gesellschaft in Bern.

- MT. min. geol. Mus. Dresden*—Mittheilungen aus dem k. mineralogisch-geologischen und prähistorischen Museum in Dresden.
- MT. orn. Ver. Wien*—Mittheilungen des ornithologischen Vereins in Wien (Vienna).
- MT. Osterlande*—Mittheilungen aus dem Osterlande (Altenburg).
- MT. Schw. ent. Ges.*—Mittheilungen der Schweizerischen entomologischen Gesellschaft (Schaffhausen). (Also with French title.)
- MT. Ung. geol. Anst.*—Mittheilungen aus dem Jahrbuche der k. Ungarischen geologischen Anstalt (Buda-Pest).
- MT. Ver. Steierm.*—Mittheilungen des naturwissenschaftlichen Vereins für Steiermark (Gratz).
- MT. Vorpomm.*—Mittheilungen aus dem naturwissenschaftlichen Vereine von Neu-Vorpommern und Rügen (Griefswald).
- MT. z. Stat. Neap.*—Mittheilungen aus der zoologischen Station in Neapel (Leipzig).
- N. Act. Ups.*—Nova Acta R. Societatis Scientiarum Upsaliensis (Upsala).
- N. Acta Ac. L.-C. Nat. cur.*—Nova Acta Academiæ Cæs. Leopoldino-Carolinæ Germaniæ Naturæ curiosorum (Leipzig). (Also *Verhandlungen der k. Leop. Carol. deutschen Acad. d. Naturf.*)
- N. Arch. Mus.*—Nouvelles Archives du Muséum d'Histoire Naturelle (Paris).
- N. Denk. Schw. Ges.*—Neue Denkschriften der allgemeinen Schweizerischen Gesellschaft für die gesammten Naturwissenschaften.
- N. Mém. Soc. Helv.*—Nouveaux Mémoires de la Société Helvétique des Sciences Naturelles (Lausanne).
- N. Mém. Soc. imp. Moscou.*—Nouveaux Mémoires de la Société impériale des Naturalistes de Moscou.
- N. Z. J. Sci.*—The New Zealand Journal of Science (Dunedin).
- Nachr. Ges. Götting.*—Nachrichten von der k. Gesellschaft der Wissenschaften und der Georg Auguste Universität zu Göttingen.
- Nachr. mal. Ges.*—Nachrichtsblatt der deutschen malakozoologischen Gesellschaft (Frankfort).
- Nat. Canad.*—Le Naturaliste Canadien (Provancher: Cap Rouge, Quebec).
- Nat.-Hist. Tr. North Durham*—Natural-History Transactions of Northumberland, Durham, and Newcastle-on-Tyne (London & Newcastle).
- Nat. Mex.*—La Naturaleza (Mexico).
- Nat. Sicil.*—Il Naturalista Siciliano: Giornale delle Scienze Naturali (Ragusa: Palermo).
- Nat. Tijdschr. Nederl. Ind.*—Natuurkundig Tijdschrift voor Nederlandsche Indie (Batavia).

- Nat. Notes*—Nature Notes, The Selborne Society's Magazine (Britten : London).
- Nat. Ver. Haarlem*—Natuurkundige Verhandelingen van de Hollandsche Maatschappig der Wetenschappen te Haarlem (Haarlem).
- Nat. Ver. Utrecht* — Natuurkundige Verhandelingen Provinciaal Utrechtsch genootschap van Kunsten en Wetenschappen (Utrecht).
- Naturalist*—The Naturalist: Journal of the Yorkshire Naturalists' Union, &c. A Monthly Journal of Natural History for North of England (Roebuck & Clarke: London & Leeds).
- Nature*—Nature (London).
- Naut.*—The Nautilus (Pilsbry & Averell : Philadelphia).
- Neujahrsbl. Naturf. Ges.*—Neujahrsblatt herausgegeben von der Naturforschenden Gesellschaft (Zurich).
- Nor. Selsk. Skr.*—K. Norske Videnskabernes Selskabs Skrifter (Throndjhem).
- Notes Leyd. Mus.*—Notes from the Royal Zoological Museum of the Netherlands at Leyden (Jentink).
- Notizbl. Ver. Erdk. Darmstadt*—Notizblatt des Vereins für Erdkunde zu Darmstadt.
- Nouv. et faits*—Nouvelles et faits divers (De Marseul : Paris).
- Nunq. ot.*—Nunquam otiosus (Schaufuss : Dresden).
- Nyt. Mag. Naturv.*—Nyt Magazin for Naturvidenskaberne (Danielssen et alii : Christiania).

*Cefv. Ak. Förh.*—Cefversigt af k. Vetenskaps Akademiens Förhandlingar (Stockholm).

*Cefv. Finska Förh.*—Cefversigt af Finska Vetenskaps Societetens Förhandlingar (Helsingfors).

*Orn. & Ool.*—Ornithologist & Oologist (Pawtucket, R. I.).

*Ornis*—Ornis : Internationale Zeitschrift für die gesammte Ornithologie (Blasius & Hayek : Vienna).

*Orvos-termesz. Értesítő.*—Orvos-természettudományi Értesítő (Kolozsvár = Klausenberg).

*Ottawa Nat.*—The Ottawa Naturalist. The Transactions of the Ottawa Field Naturalists' Club (Ottawa).

*Overs. Dan. Selsk.*—Oversigt over det k. Danske Videnskabernes Selskabs Forhandlingar (Copenhagen).

*P. Ac. Philad.*—Proceedings of the Academy of Natural Sciences of Philadelphia.

*P. Am. Ac.*—Proceedings of the American Academy of Arts and Sciences (Boston). (Also *Mem.*)

*P. Am. Ass.*—Proceedings of the American Association for the Advancement of Science. (Also *Mem.*)

- P. Am. Micr. Soc.*—Proceedings of the American Society of Microscopists (Buffalo).
- P. Am. Phil. Soc.*—Proceedings of the American Philosophical Society, &c. (Philadelphia). (Also *Trans.*)
- Pap. Soc. Brit. Columb.*—Papers and communications read before the Natural History Society of British Columbia (Victoria, B. C.).
- P. A. S. B.*—Proceedings of the Asiatic Society of Bengal (Calcutta).
- P. Bath. N. H. Soc.*—Proceedings of the Bath Natural History and Antiquarian Field Club.
- P. Belf. Soc.*—(See *Report.*)
- P. Biol. Soc. Washington*—Proceedings of the Biological Society of Washington.
- P. Birmingham. Phil. Soc.*—Proceedings of the Birmingham Philosophical Society.
- P. Birmingham. Soc.*—(See *Report.*)
- P. Bost. Soc.*—Proceedings of the Boston Society of Natural History (Boston, U.S.A.) (Also *Mem.*)
- P. Bristol Soc.*—Proceedings of the Bristol Naturalists' Society.
- P. Cal. Ac. Sci.*—Proceedings of the Californian Academy of Sciences (San Francisco). (Also *Trans.* and *Occas. Papers.*)
- P. Cambr. Phil. Soc.*—Proceedings of the Philosophical Society, Cambridge. (Also *Trans.*)
- P. Colorado Soc.*—Proceedings of the Colorado Scientific Society (Denver).
- P. Cottesw. Nat. F. C.*—Proceedings of the Cotteswold Naturalists' Field Club (Gloucester).
- P. Croydon Club*—Proceedings of the Croydon Microscopical and Natural History Club.
- P. Davenport Ac.*—Proceedings of the Davenport Academy of Natural Sciences (Davenport, Iowa).
- P. Dorset Field Club*—Proceedings of the Dorset Natural History and Antiquarian Field Club (Sherborne).
- P. E. Soc.*—Proceedings of the Entomological Society of London.
- P. E. Soc. Wash.*—Proceedings of the Entomological Society of Washington.
- P. Folkestone Soc.*—Proceedings of the Folkestone Natural History Society.
- P. Geol. Ass.*—Proceedings of the Geologists' Association (London).
- P. Hampshire Club*—Papers and Proceedings of the Hampshire Field Club (Southampton).
- P. Holmesdale Nat. Hist. Club*—Proceedings of the Holmesdale Natural History Club (London).
- P. Linn. Soc. N.S.W.*—Proceedings of the Linnæan Society of New South Wales (Sydney).



- P. Liverp. Biol. Soc.*—Proceedings of the Liverpool Biological Society.
- P. Liverp. Field Club*—Proceedings of the Liverpool Naturalists' Field Club.
- P. Liverp. Soc.*—Proceedings of the Literary and Philosophical Society of Liverpool.
- P. London Amateur Soc.*—Proceedings of the London Amateur Scientific Society. Metropolitan Scientific Association and Society of Amateur Geologists (London).
- P. Newport Nat. Hist. Soc.*—Proceedings of the Newport Natural History Society.
- P. N. H. Soc. Glasg.*—Proceedings of the Natural History Society of Glasgow.
- P. N.-Scot. Inst.*—Proceedings and Transactions of the Nova-Scotian Institute of Natural Science (Halifax, N.-S.).
- P. Phil. Soc. Glasg.*—Proceedings of the Philosophical Society of Glasgow.
- P. Phys. Soc. Edinb.*—Proceedings of the Royal Physical Society of Edinburgh.
- P. Rochester Acad.*—Proceedings of the Rochester Academy of Science (Rochester, N.Y.).
- P. R. Inst.*—Proceedings of the Royal Institution of Great Britain (London).
- P. R. Irish Ac.*—Proceedings of the Royal Irish Academy (Dublin).
- P. R. Soc.*—Proceedings of the Royal Society (London).
- P. R. Soc. Edinb.*—Proceedings of the Royal Society of Edinburgh. (Also *Trans.*)
- P. R. Soc. Queensl.*—Proceedings of the Royal Society of Queensland (Brisbane).
- P. R. Soc. Tasm.*—Papers and Proceedings and Reports of the Royal Society of Tasmania (Hobarton).
- P. R. Soc. Vict.*—Proceedings of the Royal Society of Victoria (Melbourne). (Also *Trans.*)
- P. Soc. Manch.*—(See *Mem.*)
- P. Somerset. Soc.*—Proceedings of the Somersetshire Archæological and Natural History Society. New series (Taunton).
- P. Tr. Croydon Nat. Hist. Club*—Proceedings and Transactions of the Croydon Microscopical and Natural History Club (Croydon).
- P. U. S. Nat. Mus.*—Proceedings of the United States National Museum (Washington). (Also *Bull.*)
- P.-v. Soc. Mal. Belg.*—Procès-verbaux des séances de la Société Malacologique de Belgique (Brussels).
- P.-v. Soc. Tosc.*—Processi verbali della Società Toscana delle Scienze Naturali (Pisa).
- P. Warwick. Club*—Proceedings of the Warwickshire Naturalists' and Archæologists' Field Club (Warwick).

- P. Z. S.*—Proceedings of the Zoological Society (London). (Also *Trans.*)
- Pal. Abh.*—Paläontologische Abhandlungen (Dames & Kayser : Berlin).
- Palæontogr.*—Palæontographica : Beiträge zur Naturgeschichte der Vorwelt (Cassel).
- Pal. Ind.*—Palæontologia Indica. (4to) Memoirs of the Geological Survey of India (Calcutta).
- Pal. Soc.*—Monographs of the Palæontological Society.
- Pam. Akad. umiej. wydz. przyr. Krakau*—Pamiętnik Akademii Umiejetnosci w Krakowie. Wydział matem. przyr (Cracow).
- Pam. Fizjogr.*—Pamiętnik Fizjograficzny (Warsaw).
- Phil. Tr.*—Philosophical Transactions of the Royal Society (London). (Also *Proc.*)
- Preisschr. Jblonovsk. Gesells. Leipzig*—Preisschriften gekrönt und herausgegeben von der fürstlich Jablonovski'schen Gesellschaft zu Leipzig.
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- Protok. obsch. estest. Kazan*—Protokolui zasiedaniï obshchestva estestvoisputatelei pri imperatorskom Kazanskom Universiteteye.
- Psyche*—Psyche, a Journal of Entomology. Published by the Cambridge Entomological Club (Cambridge, Mass., U.S.A.).
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- Rad jugoslav. akad.*—Rad jugoslavenske akademije znanosti i umjetnosti (Zagreb). [Transactions of the South Slav Academy of Science and Art.]
- Rec. Austral. Mus.*—Records of the Australian Muscum (Ramsay : Sydney).
- Rec. Geol. Surv. Ind.*—Records of the Geological Survey of India (Calcutta).
- Rec. Z. Suisse*—Recueil Zoologique Suisse (Fol : Geneva & Bâle).
- Rend. Acc. Nap.*—Rendiconto dell' Accademia delle Scienze Fisiche e Matematiche (Sezione della Società reale di Napoli).
- Rend. Ist. Lombardo*—Rendiconti del R. Istituto Lombardo delle Scienze e Lettere (Milan).
- Rep. Austr. Ass.*—Reportsof the Australasian Association for the Advancement of Science.
- Rep. Austr. Zool. Soc.*—Report of the South Australian Zoological and Acclimatization Society (Adelaide).
- Rep. Belfast Field Club*—Annual Report and Proceedings of the Belfast Naturalists' Field Club.

- Rep. Brighton Soc.*—Annual Report and Abstract of Proceedings of the Brighton and Sussex Natural History Society (Brighton).
- Rep. Brit. Ass.*—Report of the British Association for the Advancement of Science.
- Rep. Cornell Univ. Stat.*—Report of the Department of Entomology of the Cornell University Experiment Station (Comstock: Ithaca, N.Y.).
- Rep. Cornwall Polytechn.*—Reports of the Royal Polytechnical Society of Cornwall.
- Rep. Dep. Agric. & Rep. Ent.*—Report of the Entomologist. From the Annual Report of the Department of Agriculture (Washington).
- Rep. E. Soc. Ont.*—Report of the Entomological Society of the Province of Ontario.
- Rep. Felsted Soc.*—Report of the Felsted School Natural History Society (Chelmsford).
- Rep. Fish. Scotl.*—Annual Report of the Fishery Board for Scotland (London, Edinburgh, & Dublin).
- Rep. Geol. Surv. Canada*—Report of the Geological and Natural History Survey and Museum of Canada (Montreal).
- Rep. Guernsey Soc.*—Report and Transactions; Guernsey Society of Natural Science and Local Research.
- Rep. Ins. Illin.*—Annual Report of the Noxious and Beneficial Insects of the State of Illinois (Springfield).
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- Rep. Leeds Soc.*—Leeds Philosophical and Literary Society. The Annual Report (Leeds).
- Rep. Marl. Coll. Soc.*—Report of the Marlborough College Natural History Society.
- Rep. N. Y. Mus.*—Annual Report of the New York State Museum of Natural History (Albany).
- Rep. & P. Belfast N. H. Soc.*—Report and Proceedings of the Belfast Natural History and Philosophical Society.
- Rep. Penzance Soc.*—Report and Transactions of the Penzance Natural History and Antiquarian Society.
- Rep. Plym. Inst.*—Annual Report and Transactions of the Plymouth Institution and Devon and Cornwall Natural History Society (Plymouth).
- Rep. Rugby Soc.*—Report of the Rugby School Natural History Society.
- Rep. Tr. Devon Ass.*—Report and Transactions of the Devonshire Association for the Advancement of Science, &c. (Plymouth).
- Rep. U. S. Ent. Comm.*—Report of the United States Entomological Commission (Washington).
- Rep. U. S. Fish. Comm.*—Report of the Commissioner, United States Commission of Fish and Fisheries (Washington).

*Rep. U. S. Geol. Surv.*—Annual Report of the United States Geological Survey (Washington).

*Rep. U. S. Nat. Mus.*—Annual Report of the Board of Regents of the Smithsonian Institution. Report of the National Museum (Washington).

*Rep. Wellington Soc.*—Report of the Wellington College Natural Science Society (Wellington Coll.).

*Rep. Yorks. Phil. Soc.*—Report of the Council of the Yorkshire Philosophical Society.

*Rev. Arg. Hist. Nat.*—Revista Argentina de Historia Natural. (Ameghino : Buenos Ayres.)

*Rev. Biol.*—Revue biologique du Nord de la France (Barrois, Hallez, Moniez : Lille).

*Rev. Cien. Madrid*—Revista de los progresos de las Ciencias Exactas, Físicas, y Naturales (Madrid).

*Rev. Cient. Univ. Venezuela*—Revista Científica mensual de la Universidad Central de Venezuela (Caracas).

*Rev. d'Ent.*—Revue d'Entomologie, publié par la Société Française d'Entomologie (Fauvel : Caen).

*Rev. Mus. la Plata*—Revista del Museo de la Plata (Ameghino : la Plata).

*Rev. Quest. Sci.*—Revue des Questions Scientifiques publiée par la Société scientifique de Bruxelles (Brussels).

*Rev. Sci.*—Revue Scientifique de la France et de l'Étranger (Paris).

*Rev. Sci. Bourb.*—Revue Scientifique du Bourbonnais et du centre de la France (Olivier : Moulins).

*Rev. Sci. Nat. Oporto*—Revista de Ciencias Naturaes e Socias (Severo & Peixoto : Porto).

*Rev. Sci. Nat. Ouest.*—Revue des Sciences Naturelles de l'Ouest (Paris).

*Rev. Sci. Nat. St. Pétersb.*—Revue des Sciences naturelles. Publiée par la Société des Naturalistes à St. Pétersbourg (St. Petersburg).

*Rev. Soc. Porto*—Revista da Societa de Instrucção de Porto (Oporto).

*Rev. Tierheilkunde*—Revue für Tierheilkunde und Tierzucht (Vienna).

*Rev. Tr. Sci.*—Revue des Travaux Scientifiques (Paris).

*Rev. Zool.*—Revue Zoologique.

*Riv. Ital. Sci. Nat.*—Rivista italiana di Scienze Naturali e Bollettino del Naturalista Collettore, Allevatore, Coltivatore (Brogi : Siena).

*Rochester Nat.*—The Rochester Naturalist (Rochester).

*S. E. Z.*—Stettiner entomologische Zeitung (Dohrn : Stettin).

*Samm. Geol. Mus. Leid.*—Sammlungen des Geologischen Reichmuseums in Leiden.

*Samm. naturw. Vorträge*—Sammlung naturwissenschaftlicher Vorträge (Huth : Berlin.)

- SB. Ak. Berlin*—Sitzungsberichte der königlich Preussischen Akademie der Wissenschaften zu Berlin (formerly Bericht and Monatsbericht). (Also *Abhandl.*)
- SB. Ak. Wien*—Sitzungsberichte der mathematische-naturwissenschaftlichen Classe der k. Akademie der Wissenschaften (Vienna). (Also *Denkschriften.*)
- SB. Bayer. Ak.*—Sitzungsberichte der mathematisch-physikalischen Classe der k. Bayerischen Akademie der Wissenschaften (Munich). (Also *Abhandl.*)
- SB. Böhm. Ges.*—Sitzungsberichte der k. Böhmisches Gesellschaft der Wissenschaften (Prague). (Also *Abhandl.*)
- SB. Ges. Dorp.*—Sitzungsberichte der Naturforscher-Gesellschaft bei der Universität Dorpat (Dragendorff : Dorpat). (Also *Schriften.*)
- SB. Ges. Isis*—Sitzungsberichte und Abhandlungen der naturwissenschaftlichen Gesellschaft 'Isis' (Dresden). (Also *Abhandl.*)
- SB. Ges. Königsb.*—Sitzungsberichte der k. physikalisch-ökonomischen Gesellschaft in Preussen (Königsberg). (See *Schr. Ges. Königsb.*)
- SB. Ges. Leipzig*—Sitzungsberichte der naturforschenden Gesellschaft zu Leipzig.
- SB. Ges. Marb.*—Sitzungsberichte der Gesellschaft zur Beförderung der gesammten Naturwissenschaften zu Marburg.
- SB. Ges. Morph.*—Sitzungsberichte der Gesellschaft für Morphologie und Physiologie in München (Munich).
- SB. Ges. Würzb.*—Sitzungsberichte des physikalisch-medicinischen Gesellschaft zu Würzburg. (Also *Verh.*)
- SB. nat. Fr.*—Sitzungsberichte der Gesellschaft naturforschender Freunde zu Berlin.
- SB. niederrhein. Ges.*—Sitzungsberichte der niederrheinischen Gesellschaft für Natur- und Heilkunde (Bonn). (Published with *Verh. & CB. Ver. Rheintl.*)
- SB. Soc. Erlangen*—Sitzungsberichte der physikalisch-medicinischen Societät zu Erlangen.
- SB. z.-b. Wien*—Sitzungsberichte der zoologisch-botanischen Gesellschaft in Wien (Vienna). (Also *Verh.*)
- Schr. Ges. Danz.*—Neueste Schriften der naturforschenden Gesellschaft zu Danzig.
- Schr. Ges. Königsb.*—Schriften der physikalisch-ökonomischen Gesellschaft zu Königsberg in Preussen.
- Schr. gesamt. Naturw. Marburg*—Schriften der Gesellschaft zur Beförderung der gesammten Naturwissenschaften zu Marburg.
- Schr. Nat. ges. Dorpat.*—Schriften herausgegeben von der Naturforscher-Gesellschaft bei der Universität Dorpat. (Also *SB.*)
- Schr. Nat. Ver. Schleswig*—Schriften des naturwissenschaftlichen Vereins für Schleswig-Holstein (Kiel).
- Schr. Ver. Harzes*—Schriften des naturwissenschaftlichen Vereins des Harzes in Wernigerode.

- Schr. Univ. Kiel*.—Schriften der Universität zu Kiel.
- Science*.—Science (Dall : Cambridge, Mass.).
- Sci. Goss.*.—Hardwick's Science Gossip (Taylor : London).
- Sci. P. R. Dubl. Soc.*.—Scientific Proceedings of the Royal Dublin Society.
- Sci. Tr. R. Dublin Soc.* (2).—The Scientific Transactions of the Royal Dublin Society. Second Series.
- Scot. Nat.*.—The Scottish Naturalist (Clarke : Perth).
- Smiths. Contrib. Knowledge*.—Smithsonian Contributions to Knowledge (Washington).
- Smiths. Misc. Coll.*.—Smithsonian Miscellaneous Collections (Washington).
- Smiths. Report*.—Annual Report of the Board of Regents of the Smithsonian Institution, &c. (Washington).
- Soc. Ent.*.—Societas Entomologica.
- Soc. Agricole Pyrén.-orient.*.—Société Agricole Scientifique et Littéraire des Pyrénées-orientales (Perpignan).
- Sprawozd. Kom. fizyogr.*.—Sprawozdanie Komisji fizyograficznej, &c. (Cracow).
- Stavanger Mus.*.—Stavanger Museums Aarsberetning.
- Stud. Biol. Lab. J. Hopkins Univ.*.—Studies at the Biological Laboratory of the Johns Hopkins University (Baltimore).
- Stud. Mus. Dundee*.—Studies from the Museum of Zoology in University College, Dundee (D'Arcy Thompson : Dundee).
- Sv. Ak. Handl.*.—K. Svenska Vetenskaps-Akademiens Handlingar (Stockholm).
- Tag. Deut. Nat. Vers.*.—Tageblatt der Versammlung deutscher Naturforscher und Aertzte.
- Tijdschr. Ent.*.—Tijdschrift voor Entomologie (The Hague).
- Tijdschr. Ind. Volkenkund*.—Tijdschrift voor Indische Taal-, Land- en Volkenkunde, etc. (Brandes & Abendann, Batavia and the Hague).
- Tijdschr. Nederl. Dierk. Ver.* (2).—Tijdschrift van de Nederlandsche Dierkundige Vereeniging (Leyden).
- Tijdschr. Nederl. Ind.*.—Naturkundig Tijdschrift voor Nederlandsch Indië (Batavia).
- Timehri*.—Timehri : being the Journal of the Royal Agricultural and Commercial Society of British Guiana (Quelch : Demerara).
- Termes Közlöny*.—Természettudományi Közlöny kiadja a k. magyar termeszett. Társulat (Budapest).
- Term. füzetek*.—Természettudományi füzetek : kiadja a magyar remzeti Múzeum (Journal of Zoology, &c., edited by Hungarian Museum at Budapest).
- Tr. Albany Inst.*.—Transactions of the Albany Institute. (Formerly *Proceedings* also).

- Tr. Am. Phil. Soc.*—Transactions of the American Philosophical Society, &c. (Philadelphia). (Also *Proceedings*).
- Tr. Am. Ent. Soc.*—Transactions of the American Entomological Society (Philadelphia).
- Tr. A. S. Japan*—Transactions of the Asiatic Society of Japan (Yokohama).
- Tr. Barrow Nat. Field Club*—Transactions of the Barrow Naturalists Field Club.
- Tr. Camb. Phil. Soc.*—Transactions of the Cambridge Philosophical Society. (Also *Proceedings*.)
- Tr. City London Soc.*—Transactions of the City of London Entomological and Natural History Society (London).
- Tr. Conn. Ac.*—Transactions of the Connecticut Academy of Sciences (New Haven).
- Tr. Croydon Club.*—(See *Proceedings*.)
- Tr. Cumberl. Westmorl. Ass.*—Transactions of the Cumberland and Westmoreland Association for the Advancement of Literature and Science (Goodchild : Carlisle).
- Tr. Dumfries Nat. Hist. Soc.*—The Transactions and Journal of Proceedings of the Dumfries and Galloway Natural History and Antiquarian Society (Dumfries).
- Tr. Edin. Geol. Soc.*—Transactions of the Edinburgh Geological Society.
- Tr. Edinb. Nat. Soc.*—Transactions of the Edinburgh Field Naturalists' and Microscopical Society.
- Tr. Ess. Club = Ess. Nat.*—Essex Naturalist: being the Journal, Transactions, and Proceedings of the Essex Field Club (Buckhurst Hill).
- Tr. E. Kent Nat. Hist. Soc.*—Transactions of the East Kent Natural History Society (Canterbury).
- Tr. E. Soc.*—Transactions of the Entomological Society of London.
- Tr. Hertf. Soc.*—Transactions of the Hertfordshire Natural History Society and Field Club (Watford).
- Tr. Kansas Ac.*—Transactions of the Kansas Academy of Science (Topeka).
- Tr. Leicester Soc.*—Transactions of the Leicester Literary and Philosophical Society (Leicester).
- Tr. L. S.*—Transactions of the Linnean Society, London. (Also *Journal*.)
- Tr. L. S. New York*—Transactions of the Linnean Society of New York.
- Tr. Manch. Geol. Soc.*—Transactions of the Manchester Geological Society.
- Tr. Manch. Micr. Soc.*—Transactions of the Manchester Microscopical Society.

- Tr. Maryland Ac. Sci.*—Transactions of the Maryland Academy of Sciences.
- Tr. Norw. Soc.*—Transactions of the Norfolk and Norwich Naturalists' Society (Norwich).
- Tr. Notts. Soc.*—Transactions of the Nottingham Naturalists' Society.
- Tr. N. York Ac. Sci.*—Transactions of the New York Academy of Sciences (New York). (Also *Annals*.)
- Tr. N. Z. Inst.*—Transactions and Proceedings of the New Zealand Institute (Wellington).
- Tr. Odont. Soc.*—Transactions of the Odontological Society.
- Tr. Ottawa Nat. Club*—Transactions of the Ottawa Field-Naturalists' Club. (Also called *Ottawa Naturalist*.)
- Tr. & P. Perthsh. Soc.*—Transactions and Proceedings of the Perthshire Society of Natural Science (Perth).
- Tr. R. Irish Ac.*—Transactions of the Royal Irish Academy (Dublin).
- Tr. S. African Phil. Soc.*—Transactions of the South African Philosophical Society (Cape Town).
- Tr. R. Soc. Canada*—Proceedings and Transactions of the Royal Society of Canada (Montreal).
- Tr. R. Soc. Edinb.*—Transactions of the Royal Society of Edinburgh.
- Tr. R. Soc. S. Austr.*—Transactions of the Royal Society of South Australia (Adelaide).
- Tr. R. Soc. Vict.*—Transactions of the Royal Society of Victoria. (Also *Proceedings*.)
- Tr. Shropshire Soc.*—Transactions of the Shropshire Archæological and Natural History Society (Shrewsbury and Oswestry).
- Tr. Stirling Soc.*—Transactions of the Stirling Natural History and Archæological Society.
- Tr. St. Louis Acad.*—Transactions of the Academy of Science of St. Louis.
- Tr. Wagner Inst.*—Transactions of the Wagner Free Institute of Science of Philadelphia.
- Tr. Wisconsin Acad.*—Transactions of the Wisconsin Academy of Sciences, Arts, and Letters (Madison). (Also *Bulletin*.)
- Tr. Woolhope Nat.*—Transactions of the Woolhope Naturalists' Field Club (Hereford).
- Tr. Yorksh. Union*—Transactions of the Yorkshire Naturalists' Union (London & Leeds).
- Tr. Z. S.*—Transactions of the Zoological Society (London).
- Trav. Inst. Zool. Lille*—Travaux de l'Institut Zoologique de Lille et de la Station maritime de Wimereux (Lille).
- Trav. Lab. Histol.*—Travaux du Laboratoire d'Histologie du Collège de France, École pratique des Hautes Études (Ranvier : Paris).
- Trav. Soc. Univ. Kharkow*—Travaux de la Société des Naturalistes à l'Université impériale de Kharkow.



*Trav. Soc. Varsovie.*—Trauvauz de la Société des Naturalistes de Varsovie. Comptes rendus de la section biologique. (Also *Protokolui otdyeleniya biologhii* [Warsaw].)

*Trencsén term. egy.*—Trencsén mezzei természettudományi egysület (Trencsin).

*Tromsø Mus. Aarsh.*—Tromsø Museum's Aarshefter.

*Trudui Kazan. Univ.*—Trudui obshchestva estestvoispuitatelei pri imperatorskom Kazanskom Unīversitetzi.

*Trudui Kharkoff Univ.*—Trudui obshchestva ispytatelei prihody pre imp. Kharkovakom universitet (Kharkoff).

*Trudui obsch. est.*—Trudui obshchestva estestvoispuitatelei pri Imperatorikom Varshavskom Unīversitetye (Warsaw).

*Trudui Russ. Est.*—Trudui sezda russkich estestvoespytatelei.

*Trudui St. Petersburg Est.*—Trudui sanct Petersburgskagho obshchestva estestvoispuitatelei. (Called also *Travaux de la Société des Naturalistes de St. Petersburg.*)

*Unters. Nat.*—Untersuchungen zur Naturlehre des Menschen und der Thiere (Moleschott : Giessen).

*Upsala Univ. Årsskrift*—Upsala Universitets Årsskrift (Upsala). (Also *Act. Upsala.*)

*Verh. Ak. Amst.*—Verhandeligen der koninklijke Akademie van Wetenschappen (Amsterdam). (Also *JB.*)

*Verh. Anat. Ges.*—Verhandlungen der anatomischen Gesellschaft (Jena : published with *Anat. Anz.*).

*Verh. anthrop. Ges.*—Verhandlungen der Berliner anthropologischen Gessellschaft (Berlin).

*Verh. Deutsche Naturf.*—Verhandlungen der Gesellschaft deutscher Naturforscher und Ärzte (Leipzig or elsewhere).

*Verh. geol. Reichsanst.*—Verhandlungen der k.-k. geologischen Reichsanstalt (Vienna). (Also *JB.*)

*Verh. Ges. Basel*—Verhandlungen der naturforschenden Gesellschaft in Basel (Bâle).

*Verh. Ges. Würzb.*—Verhandlungen der physikalisch - medicinischen Gesellschaft zu Würzburg. (Also *SB.*)

*Verh. k. Leopold. Carol. Akad. Naturf.*—(See *N. Act. Ac. Leop. Carol. Nat. cur.*)

*Verh. naturw. Ver. Karlsruhe*—Verhandlungen des naturwissenschaftlichen Vereins in Karlsruhe.

*Verh. schweiz. Naturf. Ges.*—(See *Act. Soc. Helv.*)

*Verh. Siebenb. Ver.*—Verhandlungen und Mittheilungen des Siebenbürgischen Vereins für Naturwissenschaften (Hermannstadt).

*Verh. Ver. Brünn*—Verhandlungen des naturforschenden Vereins in Brünn.

*Verh. Ver. Hamb.*—Verhandlungen des Vereins für naturwissenschaftliche Unterhaltung zu Hamburg.

*Verh. Ver. Heidelb.*—Verhandlungen des naturhistorisch-medicinischen Vereins zu Heidelberg.

*Verh. Ver. Presburg*—Verhandlungen des Vereins für Natur- und Heilkunde zu Presburg.

*Verh. Ver. Rheinl.*—Verhandlungen des naturhistorischen Vereins der preussischen Rheinlande und Westphalen (Bonn). (Also *CB.*)

*Verh. z.-b. Wien*—Verhandlungen der kaiserlichen-königlichen zoologisch-botanischen Gesellschaft in Wien (Vienna). (Also *SB.*)

*Verh. d. Ver. Santiago*—Verhandlungen des Deutschen wissenschaftlichen Vereines zu Santiago (Santiago, Chili).

*Versl. Ak. Amst.*—Verslagen en Mededeelingen der k. Akademie van Wetenschappen (Amsterdam).

*Vict. Nat.*—Victorian Naturalist, The Journal and Magazine of the Field Naturalists' Club of Victoria (Melbourne).

*Vid. Medd.*—Videnskabelige Meddelelser fra den naturhistoriske Forening (Copenhagen).

*Viert. Ges. Zürich*—Vierteljahrschrift der naturforschenden Gesellschaft in Zürich (Wolf : Zürich).

*West Am. Scientist*—The West American Scientist (San Diego).

*Wien. ent. Z.*—Wiener entomologische Zeitung (Vienna).

*Wilt. Mag.*—The Wiltshire Archæological and Natural History Magazine (Devizes).

*York. Phil. Soc.*—Yorkshire Philosophical Society Annual Report (York).

*Z. Biol.*—Zeitschrift für Biologie (München).

*Z. Ent. Bresl.*—Zeitschrift für Entomologie (Breslau).

*Z. Ferdinand. Tirol Vorarlberg*—Zeitschrift des Ferdinandeums für Tirol und Vorarlberg (Innsbruck).

*Z. f. Ethnol.*—Zeitschrift für Ethnologie (Bastian & Hartmann : Berlin).

*Z. f. Thermed.*—Zeitschrift für Tiermedizin und vergleichende Pathologie).

*Z. geol. Ges.*—Zeitschrift der deutschen geologischen Gesellschaft : (Berlin).

*Z. ges. Orn.*—Zeitschrift für die gesammte Ornithologie (Von Madarász : Budapest).

*Z. Naturw.*—Zeitschrift für Naturwissenschaften. Original Abhandlungen und Berichte herausgegeben im Auftrage der naturwissenschaftlichen Vereins für Sachsen und Thüringen (Brass : Halle-a-S.).

- Z. Orn.*—Zeitschrift für Ornithologie und praktischen Geflug.  
*Z. wiss. Mikr.*—Zeitschrift für wissenschaftliche Mikroskopie und für mikroskopische Technik (Berens : Braunschweig).  
*Z. wiss. Zool.*—Zeitschrift für wissenschaftliche Zoologie (Köl liker & Ehlers : Leipzig).  
*Zapiski Kiev.*—Zapiski Kievskagho Obshchestva Estestvoïspuitatelei (Kieff).  
*Zapiski Novoross. Obsch. Estestv.*—Zapiski Novorossiskagho Obshchestva Estestvoïspuitatelei (Odessa).  
*Zoe*—*Zoe* : A Biological Journal (San Francisco).  
*Zool.*—The Zoologist (Harting : London).  
*Zool. Anz.*—Zoologischer Anzeiger (Carus : Leipzig).  
*Zool. Beitr.*—Zoologische Beiträge (Breslau).  
*Zool. Gart.*—Der Zoologische Garten (Noll : Frankfort).  
*Zool. Jahrb.*—Zoologische Jahrbücher (Spengel : Giessen).  
*Zool. JB.*—Zoologischer Jahresbericht (Mayer & Giesbrecht : Berlin).  
*Zool. Mag.*—The Zoological Magazine (Tokyo).  
*Zool. Rec.*—The Zoological Record (Zool. Soc. : London).  
*Zool. Vort.*—Zoologische Vorträge herausgegeben von William Marshall (Leipzig).

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An asterisk prefixed to a quotation signifies that the Recorder has not seen the journal or work referred to.



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# ZOOLOGICAL RECORD

## FOR 1891.

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### GENERAL SUBJECTS.\*

BY

J. ARTHUR THOMSON, M.A.

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#### A. TEXT-BOOKS, GENERAL WORKS, ESSAYS.

##### (1) TEXT-BOOKS AND GENERAL WORKS.

BEHRENS, W., KOSSEL, A., & SCHIEFFERDECKER, P. Die Gewebe des menschlichen Körpers und ihre mikroskopische Untersuchung. Bd. II. Abth I. Gewebelehre mit besonderer Berücksichtigung des menschlichen Körpers von P. Schiefferdecker und A. Kossel. Braunschweig: 8vo, xiv & 420 pp., 214 figs.

BERNARD, H. M. & M. [See LANG, A.]

BONNET, R. Grundriss der Entwicklungsgeschichte der Haus-säugethiere. Berlin : 8vo, 282 pp., 201 figs.

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\* An asterisk prefixed to a quotation indicates that the Recorder has not seen the Journal or Work referred to.

- \*BRASS, A. Atlas zur allgemeinen Zoologie und vergleichenden Anatomie.  
I. Theil. Leipzig : 4to, Heft 1, 24 pp., 6 pls. ; Heft 2, pp. 25-48,  
6 pls.
- BREHM, A. C. Tierleben. Unter Mitwirkung von W. Haacke, neu-  
bearbeitet von Pechuel-Loesche. Bd. III. Die Säugethiere.  
Leipzig und Wien : 8vo, 744 pp., 21 pls., 150 figs., 4 maps. Bd. IV.  
Die Vögel (1) 770 pp., 19 pls., 144 figs. Bd. V. Die Vögel (2) 713 pp.,  
18 pls., 126 figs.
- BRONN, H. G. Klassen und Ordnungen des Tierreiches, wissenschaftlich  
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mata*, *Cœlenterata*.]
- CARPENTER, W. B., & DALLINGER, W. H. The Microscope and its  
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W. H. Dallinger. London : 8vo, 1118 pp., 800 figs., 21 pls.
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204 figs., 4 pls.
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- \*DOLLO, L. La vie au sein des mers. Paris : 16mo, 304 pp., 46 figs.
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Auflage. Leipzig : 8vo, xxxviii & 906 pp., 20 pls., 52 tables,  
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- . [See also LANG, A.]
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Among other conclusions of a very suggestive paper, this contrast is noteworthy:—

"The transfer of energy into any inanimate material system is attended by effects retardative to the transfer and conducive to dissipation," while "the transfer of energy into any animate material system is attended by effects conducive to the transfer, and retardative of dissipation."

"The organism is a configuration of matter which absorbs energy acceleratively, without limit, when unconstrained."

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6. Helminthozoaires ou Aplocœliens.
7. Chordozoaires ou Myocœliens.

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- \*LOEB, J. Untersuchungen zur Physiologischen Morphologie der Tiere.  
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Both marking and colouring of the insect may be materially affected by altering the temperature in which the pupæ are kept.

MILNE-EDWARDS, A. De l'influence des grands froids de l'hiver sur quelques-uns des animaux de la ménagerie du Museum d'Histoire naturelle. C.R. cxii, pp. 201–205. Cf. Rev. Sci. xlvii, pp. 130 & 131.

MARSHALL, A. MILNES. Ueber Rekapitulation in der Embryologie. (Translation of Presidential Address to Biological Section of Brit. Assoc., 1890.) Nat. Rundschau, vi, pp. 1–11, 18–24, 31–36, & 42–47.

MINOT, C. S. On Certain Phenomena of Growing Old. P. Am. Ass. xxxix, pp. 271–289.

Growth (in guinea-pigs) decreases in rate from shortly after birth onwards. In the cells protoplasm increases in proportion to the nucleus. "Protoplasm, the physical basis of decrepitude"!

MORGAN, C. LLOYD. Animal Life and Intelligence. London: (1890–91) 8vo, xvi & 512 pp., 40 figs., 1 pl.

—. Nature and Origin of Variations. P. Bristol Soc. vi, pp. 249–273. Important discussion of determinate and indeterminate variations.

MORSELLI, E. [See BECCARI, O.]

Nature, Letters to, vol. xliii. G. J. ROMANES, pp. 197-198, 489-490, 582, & 583. G. HENSLOW, pp. 490 & 581-582. T. D. A. COCKERELL, p. 533. R. MELDOLA, pp. 557-558.

Nature, Letters to, vol. xlv. R. MELDOLA, pp. 7, 28-29. G. J. ROMANES, pp. 28 & 55. J. T. GULICK, pp. 29-30. G. HENSLOW, pp. 55-56. A. R. WALLACE, pp. 518-519. M. M. HARTOG, pp. 613-614.

Nature, Letters to, vol. xlv. D. SYME, pp. 30-31. A. R. WALLACE, p. 31. E. B. POULTON, pp. 52-53. E. B. TITCHENER, p. 53. F. E. BEDDARD, p. 78. A. H. TROW, pp. 102, 175-176. M. HARTOG, pp. 102-103. G. HENSLOW, p. 198. E. B. POULTON, pp. 174-175. W. L. DISTANT, p. 175.

OSBORN, H. F. Are Acquired Variations Inherited? *Am. Nat.* xxv, pp. 191-216.

"It follows as an unprejudiced conclusion from our present evidence, that upon Weismann's principle we can explain Inheritance, but not Evolution; while with Lamarck's principle and Darwin's Selection principle we can explain Evolution, but not, at present, Inheritance."

OSBORN, H. L. Heredity: its Part in Organic Evolution. *Am. Micr. J.* xii, pp. 109-111.

PLATEAU, F. Les Myriopodes marins et la résistance des Arthropodes à respiration aérienne à la submersion. *J. de l'Anat. Phys.* xxvi, pp. 236-269. *Cf. Arch. Sci. Nat.* xxv, pp. 132-134.

The power of terrestrial *Geophili*, &c., in resisting evil effects of immersion. It is a general power of abranchiata Arthropods to resist asphyxia for a long time.

RYDER, J. A. An Attempt to Illustrate some of the primary Laws of Mechanical Evolution. *P. Ac. Philad.* 1891, pp. 62-70.

SCHWALBE, G., & PFITZNER, W. Varietäten-Statistik und Anthropologie. *Anat. Anz.* vi, pp. 573-590.

SIMROTH, H. Die Entstehung der Landthiere. Ein biologische Versuch. Leipzig: 8vo, viii & 492 pp., 254 figs.

TROTTER, S. Effect of environment in the modification of the bill and tail of birds. *P. Ac. Philad.* 1891, pp. 118 & 119.

URECH, F. Beobachtungen über die verschiedenen Schuppenfarben und die zeitliche Succession ihres Auftretens (Farbenfelderung) auf den Puppenflügelchen von *Vanessa urticae* und *Io*. *Zool. Anz.* xiv, pp. 466-473.

VARIGNY, H. DE. Contribution expérimentale à l'étude de la croissance. *C.R.* cxii, p. 1380.

Dwarf forms of *Lymnaea stagnalis* due to want of space in which to move about.

[VARIGNY, H. DE.] Le transformisme expérimental. Rev. Sci. xlvii, pp. 769-777.

VOGT, C. Dogmes dans la Science. Rev. Sci. xlvii, pp. 545-552, 647-655, 746-752; xlviii, pp. 71-79.

1. La Loi Cœnogénétique.
2. La Loi Biogénétique.
3. L'identité des causes et des effets.

\*VONHOF, O. Bienenmass oder die Descendenzlehre ist ein falscher Schluss. Bremen: 8vo, 43 pp.

WALLACE, A. R. Natural Selection and Tropical Nature: Essays on Descriptive and Theoretical Biology. New edition, with corrections and additions. London: 8vo, 492 pp.

WALLACE, W. An Inquiry into the Nature of Heredity. P. Phil. Soc. Glasg. xxii, pp. 227-239.

"An individual is the independent product of forces acting during its lifetime, and owes its nature to these and not to hereditary influences; individuals that are like owe their likeness to one another in that they have their origin in ova which were like in nature, and that similar developmental forces acted in their construction."

WEISMANN, A. [See "Sex and Reproduction."] Amphimixis in relation to variation.

WHITE, W. HALE. Theory to explain the Evolution of warm-blooded Vertebrates. J. Anat. Phys. xxv, pp. 374-385.

\*WILLIAMSON, W. G. The Laws of Heredity. Chicago: 18mo, 383 pp.

WINDLE, B. C. A. Teratological Evidence as to the Heredity of Acquired Conditions. J. L. S. xxiii, pp. 448-502.

An important summary of facts, with carefully drawn conclusions.

(1) Those malformations, *e.g.*, polydactyly, whose blastogenic nature is least in doubt, are, speaking generally, those also whose hereditary nature is most distinct.

(2) Those malformations which are undoubtedly somatogenic are, so far as I know, non-hereditary, *i.e.*, are not transmitted.

(3) There remains still a number of other cases as to which no definite conclusion can be, at present, arrived at.

(4) There are certain malformations which suggest the possibility that they may have been gradually acquired, and subsequently transmitted to descendants, *e.g.*, certain eye-defects.

(5) There are certain facts which seem to indicate the gradual rise and development of a malformation, *e.g.*, the precursory conditions of cleft palate and hare-lip.

WOLFF, G. Erwiderung auf Herrn. Prof. Emery's "Bemerkungen" über meine "Beiträge zur Kritik der Darwin'schen Lehre." Biol. Centralbl. xi, pp. 321-330.

ZANDER, R. Ist die Polydactylie als theromorphe Varietät oder als Missbildung anzusehen? Beitrag zur Kenntniss des Wesens und Entstehens der Polydactylie. Virchow's Archiv. cxxv, pp. 453-487.

### c. CELL AND PROTOPLASM.

APATHY, S. Ueber die "Schaumstruktur" hauptsächlich bei Muskel- und Nervenfasern. Biol. Centralbl. xi, pp. 78-87, 127, & 128.

AUERBACH, L. [See "Sex and Reproduction."]

BALBIANI, E. G. Sur les régénérations successives du peristome comme caractère d'âge chez les Stentors et sur le rôle du noyau dans ce phénomène. Zool. Anz. xiv, pp. 312-316 & 323-327, 6 figs.

BAMBEKE, C. VAN, & STRICHT, O. VAN DER. Caryomitose et division directe des cellules à noyau bourgeonnant à l'état physiologique. Verh. Anat. Ges. 1891, pp. 169-173, 272, & 273. [*Of. Extr. Ann. Soc. Med. Gand.* Gand: 8vo, 17 pp.]

\*BARD, L. La spécificité cellulaire et les faits anatomo-pathologiques sur lesquels elle s'appuie. Verh. x Internat. Med. Kongr. Berlin, 1890, pp. 92-99.

\*BARDELEBEN, K. Karyokinese. Real-Encyklopädie ges. Med. 2<sup>te</sup> Aufl. xxiii, pp. 357-370, 16 figs.

BARFURTH, D. Zur Regeneration der Gewebe. Arch. mikr. Anat. xxxvii, pp. 406-491, 3 pls.

BATAILLON, E. Rôle du noyau dans la formation du reticulum musculaire fondamental chez la larve de Phrygane. C.R. cxii, pp. 1376-1378.

BEHRENS, W., KOSSEL, A., & SCHIEFFERDECKER, P. Die Gewebe des menschlichen Körpers und ihre mikroskopische Untersuchung. Bd. II. Abth. I. Gewebelehre mit besonderer Berücksichtigung des menschlichen Körpers von P. Schiefferdecker und A. Kossel. Braunschweig: 8vo, xiv & 420 pp., 214 figs.

Morphology and chemical characteristics of the cell and the various tissues.

BOURNE, A. G. On *Pelomyxa viridis*, n. sp., and on the Vesicular Nature of Protoplasm. Q. J. Micr. Sci. xxxii, pp. 357-374, 1 pl.

BÜRGER, O. Ueber Attraktionssphären in den Zellkörpern einer Leibesflüssigkeit. Anat. Anz. vi, pp. 484-489, 7 figs.

Attraction spheres and central corpuscles in resting cells within rhynchocœlome of Nemerteans.

BÜTSCHLI, O. Ueber die Struktur des Protoplasmas. Verh. deutsch. Zool. Ges. 1891, pp. 14-29.

History of past opinions. Conceptions in the field at present as to reticular, fibrillar, emulsion-like, vacuolar or foam-like structure of protoplasm. Arguments and observations in favour of the last.

\*CHUN, C. Ueber die Bedeutung der direkten Kernteilung. Schr. phys. ökon. Ges. Königsberg, xxxi, pp. 16-18.

DEKHUYZEN, M. C. Ueber Mitosen in frei im Bindegewebe gelegenen Leukocyten. Anat. Anz. vi, pp. 220-223, 2 figs.

FAYOD, V. Structure du Protoplasma vivant. Rev. Gén. Bot. iii, pp. 193-228, 1 pl.

Protoplasm consists of a reticulum of spiral fibrils.

\*——. De l'absorption de bouillies de poudres insolubles par les tissus végétaux et animaux comme unique moyen propre à démontrer que le protoplasme est un tissu géloforme dont les fibrilles ont une structure canaliculée et spiralée. C.R. Soc. Biol. iii, pp. 875-879.

\*FELL, G. E. The Influence of Electricity on Protoplasm. P. Am. Soc. Micr. xii, pp. 1-34, 4 pls.

FLEMMING, W. Ueber Theilung und Kernformen bei Leukocyten und über deren Attractionsphären. Arch. mikr. Anat. xxxvii, pp. 249-298, 2 pls.

Leucocytes divide both with and without mitosis. They exhibit attraction-spheres and central corpuscles. Fragmentation of the nucleus, with or without division of the leucocyte, is a degeneration or aberration, or influences cellular metabolism by increasing the nuclear surface.

——. Neue Beiträge zur Kenntniss der Zelle. Theil II. T. c. pp. 685-751, 3 pls.

Traces of a cell-plate occur in division. There is a change of the cell-substance during mitosis. The occurrence of attraction-spheres and central corpuscles in leucocytes. The spindle fibres are probably due to linin, and to the membrane of the nucleus, but are perhaps in part of double origin. The initial longitudinal splitting of the chromosomata cannot be referred to a mechanical pull exerted by spindle fibres.

——. Attraktionsphären und Centralkörper in Gewebzellen und Wanderzellen. Anat. Anz. vi, pp. 78-81, 5 figs.

Attraction-spheres and central bodies in leucocytes of *Salamandra*, &c. Though rarely seen, these bodies are probably always present, oftener double than single.

——. Ueber Zellteilung. Verh. Anat. Ges. 5 Vers. 1891, pp. 125-144.

Advances in our knowledge of cell-division since 1887.

\*——. Ueber Teilung von Leukocyten. Verh. x Internat. Med. Kongr. Berlin, ii, pp. 76-78.

1891. [VOL. XXVIII.]

\*FRANCKE, C. Die menschliche Zelle: Grundzüge ihres Daseins und ihre Gesundheitspflege. Cellular-Biologie und Cellular-Hygiene. Leipzig: 8vo, xvi & 746 pp., 240 figs., 2 pls.

FRENZEL, J. Zur Bedeutung der amitotischen (direkten) Kernteilung. Biol. Centralbl. xi, pp. 558-565.

In epithelial cells of mid-gut of Arthropods, the half cell left behind after division retains, in spite of the amitotic division, the power of multiplying.

GEBERG, A. Zur Kenntnis des Flemming'schen Zwischenkörperchens. Anat. Anz. vi, pp. 623-625, 1 fig.

In the dividing cells of the cornea of *Triton* there is seen a minute intermediate body like Flemming's *Zwischenkörperchen*.

GÖPPER, E. Kernteilung durch indirekte Fragmentierung in der lymphatischen Randschicht der Salamandrinleber. Arch. mikr. Anat. xxxvii, pp. 375-391, 1 pl.

Indirect fragmentation of nucleus in lymphatic cortical sheath of the liver in *Salamandra* and *Triton*.

GREEFF, R. Ueber den Organismus der Amöben, insbesondere über Anwesenheit motorischer Fibrillen im Ektoplasma von *Amöba terricola*. Biol. Centralbl. xi, pp. 599-608 & 633-640.

\*GUIGNARD, L. Sur l'existence des sphères attractives dans les cellules végétales. C.R. Soc. Biol. iii (9) pp. 182-185.

\*HAMMER, B. Ueber das Verhalten von Kernteilungsfiguren in der menschlichen Leiche. Inaug. Dissert. Berlin: 8vo, 39 pp.

HARTOG, M. M. [See "Sex and Reproduction."]

HEIDENHAIN, M. Ueber die Centralkörperchen und Attraktionsphären der Zellen. Anat. Anz. vi, pp. 421-427.

Attraction-spheres and centrosomata in the leucocytes of *Salamandra*, in the medullary cells of young rabbits, in the alveolar epithelium and leucocytes in the lung of a pneumonic subject.

\*HENKING, H. Ueber plasmatische Strahlungen. Verh. deutsch. Zool. Ges. 1891, pp. 29-36.

HENNEGUY, L. F. Nouvelles recherches sur la division cellulaire indirecte. J. de l'Anat. Phys. xxvii, pp. 397-423, 1 pl.

\*—. Sur le rôle des sphères attractives dans la division indirecte des noyaux. C.R. Soc. Biol. iii, pp. 473-475.

HERMANN, F. Beitrag zur Lehre von der Entstehung der karyokinetischen Spindel. Arch. mikr. Anat. xxxvii, pp. 569-586, 1 pl., 2 figs.

Achromatin spindle due to cytoplasm, perhaps helped by achromatin of nucleus. From the dividing centrosomata to the nucleus there extend contractile (cytoplasmic) fibrils, which enter into a secondary connection with the achromatin fibres of the nucleus.



[HERMANN, F.] Ueber die Entstehung der karyokinetischen Spindelfigur. Biol. Centralbl. xi, pp. 670-672.

\*HERTWIG, O. Ueber pathologische Veränderung des Kernteilungsprozesses infolge experimenteller Eingriffe. Internat. Beitr. wiss. Med. i, pp. 195-212.

KOSSEL, A. Ueber die chemische Zusammensetzung der Zelle. Verh. Phys. Ges. Berlin in Arch. Anat. Phys. (Phys. Abth.) 1891, pp. 181-186.

——. [See also BEHRENS, W.]

LÖWIT, M. Ueber amitotische Kernteilung. Biol. Centralbl. xi, pp. 513-516.

Amitotic division may be both regenerating and degenerative.

\*LUKJANOW, S. M. Grundzüge einer allgemeinen Pathologie der Zelle. Leipzig : 8vo, viii & 325 pp.

MACALLUM, A. B. Morphology and Physiology of the Cell. Tr. Can. Inst. i, pp. 247-278.

McKENDRICK, J. G. President's Address : On some of the Problems of Modern Physiology. P. Phil. Soc. Glasg. xxii, pp. 1-21.

Some discussion of the structure and metabolism of protoplasm.

\*MATZDORFF, C. Zur Zellenlehre. Naturw. Wochenschr. vi, pp. 85-87 & 126-129.

MEVES, F. Ueber amitotische Kernteilung in der Spermatogonien des Salamanders und Verhalten der Attraktionsphären bei derselben. Anat. Anz. vi, pp. 629-639, 11 figs.

In the spermatogonia of *Salamandra* amitotic division often occurs, especially in March and in September and October ; mitosis also occurs, rarely in spring, more frequently in autumn, and predominantly from May till August. This periodicity suggests that the amitotic division is not necessary to the normal regeneration of the testes. An annular attractive sphere was observed.

MORRIS, J. C. An hypothesis as to the Nature and Origin of Germ Force. P. Ac. Philad. 1891, pp. 73 & 74.

MÜLLER, H. F. Ein Beitrag zur Lehre vom Verhalten der Kern- zur Zellsubstanz während der Mitose. SB. Ak. Wien, c, pp. 179-188, 1 pl.

In elements of blood in spleen of *Triton* the nuclear membrane disappears in mitosis, and the cell-substance mingles with the nuclear substance.

\*NUEL, J. P. Contribution à l'étude de la structure fibrillaire des protoplasmes cellulaires. Verh. x Internat. Med. Kongr. Berlin (1890) ii, pp. 1-4.

\*PALADINO, G. Gli infinitamente piccoli o i trionfi della dottrina cellulare. Discorso inaugurale. Estr. d. Annuario scolastico, 1890-91. 4to, 25 pp.

\*PREYER, W. Zur Physiologie des Protoplasmas. Naturw. Wochenschr. vi, pp. 1-4, 27-31, & 421-425.

RATH, O. v. Ueber die Bedeutung der amitotischen Kerntheilung im Hoden. Zool. Anz. xiv, pp. 331, 332, 342, 343, & 355-363, 3 figs.

In all cases in which amitotic division occurs in the testes, it is restricted to the marginal or supporting cells. The formation of spermatozoa and the regeneration occur solely by mitosis.

\*REINKE, F. Untersuchungen ueber das Verhalten der von Arnold beschriebenen Kernformen zu Mitose und Amitose. Inaug. Diss. Kiel: 8vo, 14 pp.

RYDER, J. A. On two new and undescribed Methods of Contractility manifested by Filaments of Protoplasm. P. Ac. Philad. 1891, pp. 10-12.

In *Vorticella* there are unequally contracting discs fixed in a spiral manner; in *Trypanosoma balbianii* there is a rapid reversal of the spiral in a dextral or a sinistral direction.

SCHÄFER, E. A. On the Structure of Amœboid Protoplasm, with a Comparison between the Nature of the Contractile Process in Amœboid Cells and in Muscular Tissue, and a Suggestion regarding the Mechanism of Ciliary Action. P. R. Soc. xlix, pp. 193-198.

Spongioplasm is reticular, with an affinity for hæmatoxylin; hyaloplasm is structureless and is chemically different. Hyaloplasm is the more active, and flows, *e.g.*, in pseudopodia. A rhythmic flowing of hyaloplasm in and out of a hollow extension of a cell will explain the movement of a cilium.

SCHIEFFERDECKER, P. [See BEHRENS, W.]

SCHNEIDER, K. C. Untersuchungen über die Zelle. Arb. z. Inst. Wien, ix, pp. 179-224, 2 pls.

—. Ueber Zellstrukturen. Zool. Anz. xiv, pp. 44-46, 49, & 50.

Bars of nuclear framework are connected through the nuclear membrane with the protoplasmic framework. The framework consists of looped fibres of uniform thickness, which may unite with one another and form membranes. Nucleoli are aggregations of chromatin grains, and may be resolved into them again. The spindle-fibres are modified contractile bars of the framework.

SCHÜTZENBERGER, P. Essai sur la synthèse des matières protéiques. C.R. cxii, pp. 198-201.

SCHWARZ, E. Zur Theorie der Kernteilung. Arch. path. Anat. cxxiv, pp. 488-506, 9 figs.

SOLGER, B. Zur Kenntnis der Pigmentzellen. Anat. Anz. vi, pp. 162-165, 2 figs.

—. Ueber Pigmenteinschlüsse in der Attraktionsphäre ruhender Chromatophoren. T. c. pp. 282-284, 2 figs.

[SOLGER, B.] Zur Kenntniss der "Zwischenkörper" sich teilender Zellen.  
T. c. pp. 482 & 483, 3 figs.

Hint of an intermediate body in division of connective tissue cells in the ammon of the rat.

°——. Die radiären Strukturen des Zellkörpers im Zustande der Ruhe und bei der Kernteilung. Berl. Klin. Wochenschr. 1891, pp. 481-484, 5 figs.

STRASBURGER, E. Das Protoplasma und die Reizbarkeit. Jena : 8vo, 38 pp.

VERSON, E. Zur Beurteilung der amitotischen Kernteilung. Biol. Centralbl. xi, pp. 556-558.

In spermatogenesis of *Bombyx*, a giant-nucleus gives rise, by indirect division, to secondary nuclei, which thereafter multiply abundantly by amitosis.

VERWORN, M. Die physiologische Bedeutung des Zellkerns. Arch. ges. Phys. xv, pp. 1-118, 6 pls.

(a) Experiments on *Thalassicolla*, *Astrolithium*, *Orbitolites*, *Amphistegina*, *Bursaria*.

(b) Criticism of previous opinions:—The vital processes of the cell depend on interactions between nucleus, protoplasm, and outer world. "The physiological import of the nucleus depends solely upon its metabolic relations to the rest of the cell. Only by these metabolic relations does it exert an influence on the functions of the cell and enter into its life."

——. Studien zur Physiologie de Flimmerbewegung. *Op. cit.* xlviii, pp. 149-180, 4 figs.

VIRCHOW, R. Der Stand der Cellular-pathologie. Virchow's Archiv. cxxvi, pp. 1-11.

°VOGT, J. G. Das Empfindungsprincip und das Protoplasma auf Grund eines einheitlichen Substanzbegriffes. Leipzig : 8vo (i) vi & 48 pp. ; (ii) pp. 49-104.

WATASE, S. On Caryokinesis. Biol. Sect. Wood's Holl, pp. 168-187. [See WHITMAN, C. O., "Text-Books."]

The origin of the spindle, its behaviour towards the nucleus, the formation of the equatorial chromatin plate, the separation of the daughter-plates, the formation of the interzonal filaments, are phases in one continuous process.

WIESNER, J. Die Elementarstruktur und das Wachstum der lebenden Substanz. Wien : 8vo, viii & 283 pp.

ZIEGLER, H. E. Die biologische Bedeutung der amitotischen (direkten) Kernteilung im Tierreich. *Biol. Centralbl.* xi, pp. 372-389; *cf. t. c.* pp. 744-757.

Amitotic or direct division represents the end of a series of divisions, and is a symptom of more or less degeneration.

— The Biological Import of Amitotic (Direct) Nuclear Division in the Animal Kingdom. *Ann. N. H.* vii, pp. 362-380.

ZOJA, L. & R. Sur les plastidules fuchsinophiles (Bioplastes d'Altmann) dans la série animale. *Arch. Ital. Biol.* xvi, pp. 71-79.

— Ueber die fuchsinophilen Plastidulen. *Arch. Anat. Phys. Anat. Abth.* 1891, pp. 335-351.

— Intorno al plastiduli fuscinoili (bioplasti dell' Altmann). *Mem. R. Ist. Lomb.* xvi, pp. 237-270, 2 pls.; *J. Microgr.* xv, pp. 233-238 & 263-267.

The bioplasts of Altmann, or the plastidules of Maggi, their wide occurrence and perhaps nutritive function in animal cells.

#### D. OOGENESIS AND FERTILISATION.

ALEXENKO, N. Contribution à l'histologie normale et pathologique des ovaires de la femme. *Ann. Gynécol.* xxxv, pp. 417-427.

AUERBACH, L. [See "Sex and Reproduction."]

"The sexual contrast is based on the occurrence of two substances which are qualitatively different, the male being cyanophilous, the female erythrophilous."

BERNARD, H., & BRATUSCHECK, K. Der Nutzen der Schleimhüllen für die Froscheier. *Biol. Centralbl.* xi, pp. 601-604.

Uses of jelly-sphere round frog ovum, in protecting from drought, pressure, birds, fishes, &c., in forming interspaces in which Algæ live, but especially in forming an incubating chamber retaining heat.

BÜHM, A. A. Die Befruchtung des Forelleneies. *SB. Ges. München*, 1891, pp. 63-73, 13 figs.; *München. med. Wochenschr.* xxxviii, pp. 539-542.

BRAUER, A. Ueber die Entwicklung von Hydra. *Z. wiss. Zool.* lii, pp. 169-216, 4 pls.

— Ueber die Entstehung der Geschlechtsprodukte und die Entwicklung von *Tubularia mesembryanthemum*, Allm. *T. c.* pp. 551-579, 3 pls.

CUNNINGHAM, J. T. On some Disputed Points in Teleostean Embryology. *Ann. N. H.* vii, pp. 203-221.

Origin of periplast nuclei, &c.

DRIESCH, H. *Entwicklungsmechanische Studien.* I. Der Werth der beiden ersten Furchungszellen in der Echinoderm-Entwicklung. Experimentelle Erzeugung von Theil- und Doppelbildungen. II. Ueber die Beziehungen des Lichtes zur ersten Etappe der thierischen Formbildung. *Z. wiss. Zool.* liii, pp. 160–184, 1 pl., 2 figs.

If one of the two first cells of the segmenting ovum of *Echinus microtuberculatus* be isolated, it segments as if it were a half of the intact embryo, but eventually forms an entire individual of half the normal size.

EIGENMANN, C. H. On the precocious segregation of the sex cells in *Micrometrus aggregatus*, Gibbons. *J. Morph.* v, pp. 481–492, 1 pl.

In the development of the Teleostean *Micrometrus aggregatus* the reproductive cells are segregated from the surrounding cells about the time the blastopore closes.

FIEDLER, K. *Entwicklungsmechanische Studien an Echinodermeneiern.* Sep. Abd. Festschrift K. W. v. Nägeli und A. v. Kölliker. Zürich: 1891, pp. 191–196.

Slight injury to one of the two first cells of the segmented ovum of Echinoids sometimes resulted in small but normal embryo; but in most cases not even the blastula stage was reached.

FOL, H. Contribution à l'étude de la fécondation. *C.R.* cxii, pp. 877–879, 10 figs.

The sperm-nucleus forms a spermocentre; the ovarian pronucleus forms an ovocentre; after "solar" and "aureolar" phases, the spermocentre and the ovocentre are divided into halteres. In the next phase the spermocentre and the ovocentre are divided, and the halves go through a "marche du quadrille." Fertilisation consists not only in the addition of two demi-centres derived from the parent organisms, but in the union of two demi-spermocentres with two demi-ovocentres to form the two first astrocentres.

—. Die "Centrenquadrille," eine neue Episode aus der Befruchtungsgeschichte. *Anat. Anz.* vi, pp. 266–274, 10 figs.

—. Sulla quadriglia dei centri; un episodio nuovo della fecondazione. *Atti [Rend.] Acc. Rom.* vii, pp. 431–434, 10 figs.

\*GASTEL, L. Contribution à l'étude des follicules de Graaf et des corps jaunes. Paris: 8vo, 54 pp., 1 pl.

GIACOMINI, E. Ueber die Entwicklung von *Seps chalcides*. *Anat. Anz.* vi, pp. 548–551.

\*GUIGNARD, L. Sur la nature morphologique du phénomène de la fécondation. *C.R. Soc. Biol.* iii, pp. 467–470.

HÆCKER, V. Die Richtungskörperbildung bei *Cyclops* und *Gantheria*. *Biol. Centralbl.* xi, pp. 668–670.

[HÆCKER, V.] Die Richtungkörperbildung bei *Cyclops* und *Canthocamptus*. Ber. Ges. Freiberg, vi, pp. 30-32.

HANCOCK, J. L. Triple Fertilisation in Egg of Domestic Fowl. Am. Nat. xxv, p. 1030.

HARTOG, M. M. [See "Sex and Reproduction."]  
On nature of fertilisation.

HENKING, H. [See "Spermatogenesis."]

HEYMONS, R. Die Entwicklung der weiblichen Geschlechtsorgane von *Phyllodromia (Blatta) germanica*, L. Z. wiss. Zool. liii, pp. 434-536, 3 pls.

HOLL, M. Ueber die menschliche Eizelle. Anat. Anz. vi, pp. 551-556, 4 figs.

OPPEL, A. Die Befruchtung des Reptilieneies. T. c. pp. 536-544, 4 figs.

\*PALADINO, G. Des ponts intercellulaires entre l'œuf ovarique et les cellules du follicule, formation de la zone pellucide. J. Microgr. xv, pp. 79-84.

RÜCKERT, J. Zur Befruchtung des Selachiereies. Anat. Anz. vi, pp. 308-322. Cf. Verh. Anat. Ges. 1891, pp. 253 & 254.

Merocytes of Selachian ovum are, in great part at least, supernumerary sperm-nuclei, for physiological polyspermy occurs.

SCHOTTLAENDER, T. Beitrag zur Kenntniss der Follikelatresie nebst einigen Bemerkungen über die unveränderten Follikel in den Eierstöcken der Säugethiere. Arch. mikr. Anat. xxxvii, pp. 192-238, 2 pls.

Degeneration of the follicle is an almost uniform process in the ovaries of the guinea-pig, rat, mouse, and dog. First the ovum degenerates, then the epithelium; before the latter disappears there is remarkable proliferation in the theca.

VEJDovsky, F. Bemerkungen zur Mitteilung H. Fol's "Contribution à l'histoire de la fécondation." Anat. Anz. vi, pp. 370-375.

Vejdovsky's "periplasts" (1886) = attractive spheres; central corpuscles = daughter periplasts. The periplast arises independently of the sperm-cytoplasm; daughter periplasts appear endogenously within it. In *Rhynchelmis* there is no "marche du quadrille."

WATASE, S. Studies on *Cephalopoda*. I. Cleavage of ovum. J. Morph. iv, pp. 247-302, 4 pls.

Bilateral character of segmenting ovum. Details as to karyokinesis, archoplasmic filaments, &c.

WEISMANN, A. [See "Sex and Reproduction."]  
On amphimixis, reduction-divisions, &c.

## E. SPERMATOGENESIS.

BALLOWITZ, E. Weitere Beobachtungen über den feineren Bau der Säugethier-spermatozoen. Z. wiss. Zool. lii, pp. 217-293, 3 pls.

—. Die Bedeutung der Valentin'schen Querbänder am Spermatozoen-kopfe der Säugethiere. Arch. Anat. Phys. Anat. Abth. (1891) pp. 193-211, 1 pl.

\*—. Die innere Zusammensetzung des Spermatozoenkopfes der Säugethiere. CB. Physiol. v, pp. 65-68.

BARDELEBEN, K. Ueber den feineren Bau der menschlichen Spermatozoen. Verh. Anat. Ges. 1891, pp. 157-165, 4 figs.

Details as to minute structure of spermatozoa. In the spermatozoa of all animals there are to be distinguished: (1) generative matter; (2) nutrient matter; (3) motor protoplasm; (4) adaptations for entrance into ovum.

BENDA, C. Neue Mittheilungen über die Entwicklung der Genitaldrüsen und über die Metamorphose der Samenzellen (Histiogenese der Spermatozoen). Verh. Phys. Ges. Berlin, in Arch. Anat. Phys. Phys. Abth. 1891, pp. 549-552.

\*BERTACCHINI, P. La Spermatogenesi nella *Rana temporaria*. Month. Int. J. Anat. Hist. viii, pp. 140-168, 2 pls.

BROWN-SÉQUARD. Remarques sur la spermine et le liquide testiculaire. Arch. Phys. xxiii, pp. 401-403.

—. Exposé de faits nouveaux montrant la puissance que semble avoir le liquide testiculaire contre certaines maladies, et en particulier la tuberculose pulmonaire. T. c. pp. 224-229.

CUNNINGHAM, J. T. Spermatogenesis in *Myxine*. Zool. Anz. xiv, pp. 22-27.

—. Spermatogenesis in *Myxine glutinosa*. Q. J. Micr. Sci. xxxiii, pp. 169-186, 1 pl.

Within the unripe capsules of the testis are "spermatocytes" (spermatogonia), which multiply by karyokinesis and form spermatozoa. The chromatin of each spermatocyte nucleus forms a number of sperm-nuclei which pass out, point forwards, from the spermatoblast, trailing a thread of protoplasm behind them. The spermatogenesis is liker that of some Chætopods and Molluscs than that of Vertebrates.

\*DUBERN, G. Some Points on the Histology of Spermatozoa and allied Matter. Indian Med. Rev. ii, pp. 30-36.

ETZOLD, F. Die Entwicklung der Testikel von *Fringilla domestica* von der Winterruhe bis zum Eintritt des Brunft. Z. wiss. Zool. lii, pp. 46-84, 1 pl.

HENKING, H. Untersuchungen über die ersten Entwicklungsvorgänge in den Eiern der Insekten. II. Ueber Spermatogenese und deren Beziehung zur Eientwicklung bei *Pyrrhocoris apterus*, L. *Op. cit.* li, pp. 685-736, 3 pls., 1 fig.

Primordial sperm-cells correspond to primordial ova; both contain 24 chromosomes; the spermatocytes of the first order correspond to immature ova; the formation of polar bodies corresponds to the two divisions of spermatocytes, in both there is a "reduction-division." Details as to minute structure of the spermatosoma.

HERMANN, F. [See "Cell and Protoplasm."]

JORDAN, E. O. The Spermatophores of *Diemyctylus*. *J. Morph.* v, pp. 263-270.

LODE, A. Untersuchungen über die Zahlen- und Regenerations-Verhältnisse der Spermatozoiden bei Hund und Mensch. *Arch. ges. Phys.* xv, pp. 278-292.

\*—. Ueber Spermaproduktion beim Menschen und beim Hunde. *Wien. med. Blätter*, xiv, pp. 754 & 755.

MADDOCK, R. L. Some observations of the various forms of human Spermatozoa. *J. R. Micr. Soc.* 1891, pp. 1-5, 1 pl.

MEVES, F. Ueber amitotische Kernteilung in den Spermatogonien des Salamanders und Verhalten der Attraktionssphäre bei derselben. *Anat. Anz.* vi, pp. 626-639, 11 figs.

MONTICELLI, F. S. Della spermatogenesi dei Trematodi. *Boll. Soc. Nat. Napoli*, v, pp. 148-150.

PICTET, C. Recherches sur la spermatogénèse chez quelques Invertébrés de la Méditerranée. *MT. z. Stat. Neap.* x, pp. 75-152, 3 pls.; also Leipzig: 8vo, 83 pp., 3 pls.

Description of spermatogenesis of 5 Echinoids, a Siphonophore, a Pteropod, a Cephalopod, a Polychæte (*Eteone*), and *Salpa virgula*. The nucleus of the spermatide forms the head of the spermatozoon; the nucleus proper is dissolved in karyoplasma, its apparent structure is a post-mortem appearance, but after the penetration of the spermatozoon into the ovum, a definite structure is assumed. The tail is formed from cytoplasm. The accessory nucleus is an eliminating corpuscle; in *Eteone* it is detached from the cell, in *Siphonophora* it persists by the side of the nucleus; in most Echinoids it forms the median segment of the spermatozoon.

RATH, O. v. Ueber die Bedeutung der amitotischen Kerntheilung im Hoden. *Zool. Anz.* xiv, pp. 331, 332, 342, 343, 355-363, 3 figs.

Spermatogenesis proper in *Astacus*, &c., occurs solely by mitosis. Amitotic division is restricted to the marginal Stützzellen.

RUSSO, A. Ricerche sulla distruzione e sul rinnovamento del parenchima ovarico nelle *Ophiuræ*. *T. c.* pp. 50-59, 15 figs.



<sup>6</sup>[RUSSO, A.] *Richerche citologiche sugli elementi seminali delle Ophiuree* (spermatogenesi-oogenesi). *Int. Month. J. Anat. Phys.* viii, pp. 293-329.

VERSON, E. *Spermatogénèse du Bombyx mori*. *Arch. Ital. Biol.* xv, pp. 177-180.

WHITMAN, C. O. [See "Sex and Reproduction."]

ZIMMERMANN, K. W. *Ueber den Kernteilungsmodus bei der Spermatogenese von Helix pomatia*. *Verh. Anat. Ges.* 5 Vers. 1891, pp. 187-193.

## F. SEX AND REPRODUCTION.

AUERBACH, L. *Ueber einen sexuellen Gegensatz in der Chromatophilie der männlichen und weiblichen Geschlechtsproducte*. *Verh. Physiol. Ges. Berlin*, 1890-91, in *Arch. Anat. Phys. (Physiol. Abth.)* 1891, pp. 532-535.

— *Ueber einen sexuellen Gegensatz in der Chromatophilie der Keimsubstanzen nebst Bemerkungen zum Bau der Eier und Ovarien niederer Wirbelthiere*. *SB. Ak. Berlin*, 1891, pp. 713-750.

The sex-elements differ in nuclear characters. The head of the ripe spermatozoon is cyanophilous, the germinal vesicle and the nucleoli are erythrophilous.

\* — *Zur Charakteristik von Ei und Samen*. *Berlin. Klin. Wochenschr.* xxviii, pp. 908 & 909; *Naturw. Wochenschr.* vi, pp. 425 & 426.

BERNARD, H. *Hermaphroditismus bei Phyllopoden*. *Jen. Z. Nat.* xxv, pp. 337 & 338. [*Cf. Nature*, xliii, pp. 343 & 344.]

*Lepidurus glacialis*, *Apus cancriformis*, and *Lepidurus productus* are hermaphrodite—an adaptation to the risks of isolation. The males of *Apodide* are generally smaller than the hermaphrodites.

BERTKAU, PH. *Beschreibung eines Arthropoden-Zwitter*. *Arch. f. Nat.* lvii, pp. 229-238, 1 pl.

Hermaphrodite *Lycosa*. List of casually hermaphrodite Arthropods includes 361 cases: 9 Crustaceans, 3 Arachnids, and 349 Insects!

CANNIEU, A. *Sur l'évolution sexuelle des Truites des Pyrénées*. *C.R.* cxii, pp. 957-959.

CANO, G. *Morfologia dell'apparecchio sessuale femminile, glandole del cemento e fecondazione nei Crostacei Decapodi*. *MT. z. Stat. Neap.* ix, pp. 503-532, 1 pl.

FULTON, T. W. *The Comparative Fecundity of Sea-Fishes*. *Rep. Fish. Scotl.* ix, pp. 243-268.

In a large number of fishes there are successive crops or layings of eggs. Tables are given showing the ratio of the weight of the ova present at

one time to the weight of the rest of the fish. Instances of the very different degree of ease with which the ova are carried in different species. In most cases it would be quite impossible for the fish to carry simultaneously, in the mature condition, all the eggs which the conditions of the struggle for existence have made it imperative it should produce. Perhaps this explains: (1) why among most sea-fishes there is a general, and sometimes a great, preponderance of females. On the other hand, among fish with demersal ova extruded in large quantities the males predominate. Perhaps the above-mentioned fact also explains (2) the generally larger size of the female fish, and (3) the more or less sudden increase of bulk which occurs in the ovum shortly before extrusion. Proportional number of ova produced by different species. Variation in fecundity in individuals of the same species.

FREDERICQ, L. Ueber Autotomie. *Arch. Ges. Phys.* xv, pp. 600-602.

FRENZEL, J. Ueber die Selbstverstümmelung (Autotomie) der Thiere. *T. c.* pp. 191-214.

Illustrations of the wide occurrence of autotomy; its restriction to definite predisposed regions of the body; its real causes not yet analysed.

GRUVEL, A. De quelques phénomènes de reproduction chez les Cirrhipèdes. *C.R.* cxiii, pp. 707 & 708.

Usually reciprocal fecundation in *Cirrripedia*. Where this is impossible, there may be self-fecundation, as seems to occur in *Pollicipes*.

HARTOG, M. M. Abstract of Maupas's Researches on Multiplication and Fertilisation in Ciliate Infusorians. *Q. J. Micr. Sci.* xxxii, pp. 599-614.

HARTOG, M. M. Some Problems of Reproduction: a comparative study of gametogeny and protoplasmic senescence and rejuvenescence. *Op. cit.* xxxiii, pp. 1-79.

In absolutely agamous forms of *Monadineæ* rest is the only agent of rejuvenescence. In apogamous and self-fertilising organisms change of the mode of life is a frequent mode of rejuvenescence. In higher *Monadineæ* and *Myxomycetes* the cytoplasm is renewed by plastogamy. A step in advance, involving karyogamy, is isogamy, plural and binary. In rejuvenescence the karyogamy is due to the fact that the zygote nucleus and cytoplasm form a new cell-association. Illustrations of the manner in which other modes of rejuvenescence may replace the karyogamy of gametes. Those organisms that have attained the capability of karyogamic rejuvenescence may, by prolonged fissile reproduction without karyogamy, pass into a senile condition marked by reproductive incapacity. Rapidly repeated nuclear fissions, without sufficient interval for nutrition and recovery, may lower the vital energy of the cell, and accelerate this reproductive incapacity; but this is a matter of constitutional temperament. A further evolution of this constitutional weakness takes place in

forms which are either exogamous or sexually differentiated. Here the nuclei which fuse to remove the reproductive incapacity must be of distinct origin. Exogamy of isogametes is merely the expression of karyogamic incompatibility of close blood relations. The constitutional weakness of the later terms of a cycle of fissions is largely due to the continuance of the association of nucleus and cytoplasm unchanged. The evil effects of the prolonged association are probably due (a) to the nucleus responding less actively to the stimuli from the cytoplasm; (b) its consequently inadequate directive power; (c) the resulting bad performance of its work by the cytoplasm; (d) the imperfect nutrition of the nucleus; (e) the failure of the cell as an organic whole. Replacement theories of fertilisation fail to account for one or more of the following facts:—(a) multiple isogamy; (b) the non-discrimination of the broods of exo-isogametes into two categories, of which the members of either would pair with those of the other category, but not of their own; (c) the absence of "excretion phenomena" of any kind in so many cases of gametogeny; (d) the existence of true parthenogenesis of male as well as female gametes; (e) the formation of a male individual from the exclusively female oosphere of the hive-bee.

HEAPE, W. Preliminary note on the transplantation and growth of Mammalian ova within a uterine foster-mother. P. R. Soc. xlviii, pp. 457 & 458.

Two ova from an Angora doe rabbit (fertilized thirty-two hours previously by an Angora buck) were transferred into the upper end of the Fallopian tube of a Belgian doe rabbit, which had been fertilized three hours before by a buck of her own breed. When the Belgian doe gave birth, four young were Belgian, two Angoras.

ISCHIKAWA, C. Vorläufige Mittheilungen über die Conjugationerscheinungen bei den Noctiluceen. Zool. Anz. xiv, pp. 12-14, 4 figs.

In conjugating the two cells become one. The nuclei do not fuse, but remain lying apposed. Division of both takes place so that half of each nucleus passes into each of the two resulting portions.

—. On the formation of Eggs in the Testis of *Gebia major*, De Haan. T. c. pp. 70-72, 2 figs.

The testis of *Gebia major* (20 males with secondary sexual characters) produces ova posteriorly. The ova do not pass out.

KNATZ, L. Ueber Entstehung und Ursache der Flügelmangel bei den Weibchen vieler Lepidopteren. Arch. f. Nat. lvii, pp. 49-74, 1 pl.

There are 183 cases of female *Lepidoptera* with reduced or absent wings.

KNAUTH, K. Zur Biologie der Fische. Zool. Anz. xiv, pp. 73-76.

MAUPAS, M. Sur le déterminisme de la sexualité chez l'*Hydatina senta*. C.R. cxiii, pp. 388-390.

The ovum, at first neutral, tends to produce a female if temperature is lowered, a male if it be raised.

MEUNIER, J. La Ponte des Insectes. Rev. Sci. xlviii, pp. 328-335.  
Laws of oviposition.

PARONA, C. L'autotomia e la rigenerazione delle appendici dorsali (*Phenicurus*) nella *Tethys leporina*. Zool. Anz. xiv, pp. 293-295.

PERRIER, C. Mission Scientifique du Cap Horn. vi. Zoologie. Paris : 4to, 198 pp., 13 pls. (See *Echinodermata*.)

*Inter alia* : In all starfishes mutilated parts are regenerated ; in some, one half of the body is almost always been regrown ; a separate arm may form a new organism ; the number of arms is not quite constant in the same species.

RANDOLPH, H. The Regeneration of the Tail in *Lumbriculus*. Zool. Anz. xiv, pp. 154-156.

RYDER, J. A. The Origin of Sex through Cumulative Integration, and the relation of Sexuality to the Genesis of Species. P. Am. Phil. Soc. xxxviii (1890), pp. 109-159.

Cumulative integration or assimilation beyond the current needs of the parent organism—a characteristic of living matter ; its most important consequence, growth. With continuous growth the tendency to disproportionate increase of mass over surface interferes, and division results. In the simplest forms one kind of living matter is produced, subsequently a differentiation of cytoplasm and nucleoplasm occurred, with important interactions. The more primitive cells, poorly provided with cytoplasm, represent "male" elements ; subsequently by cumulative integration arose cells with a cytoplasmic field—"female" elements. By extreme reduction of the cytoplasm male cells became incapable of independent development. The two elements became reciprocally attractive. Fertilisation is a reciprocal restoration of the equilibrium between the nucleoplasm and the cytoplasm of ovum and spermatozoon. Metazoa arose in consequence of cumulative integration and relative increase of cytoplasm. There was a time when asexual reproduction, through fission without karyokinesis, was effected by forms "morphologically male." "When individuals became developed in which the physiological functions of the individual were so adjusted automatically, through a correlation of those functions, as to impede the production of chromatin or nucleoplasm, presumably through a too rapid action of cumulative integration, cytoplasm was produced in a preponderating measure, the spermatogonia were hypertrophied, and discharged before complete maturation as ova. In this way femaleness arose, and as 'sex' thus became reflected in the physiological tendencies of the individuals of a species, some became male

and others female." "The female is a repressed male state. The male state, on account of its prodigious fertility and the flagellate type of its products, is a reversion to the asexual method of reproduction, as respects the physiological methods involved, and the morphological character of the elements produced. Male and female products were at first and still continue to be delivered as useless products of over-assimilation. Continuous growth was the primary factor in divergent evolution. The polar bodies are a phylogenetic reminiscence of the asexual or male flagellate state. The view that the female is preponderatingly 'anabolic' and the male 'katabolic,' as held by Geddes and Thomson, cannot be sustained on the basis fact, since it is readily demonstrated that the male element represents a higher product of constructive metabolism than the female."

TRAUTZSCH, H. Anmerkungen zu den Versuchen des Herrn Dr. Loeb über Heteromorphose. Biol. Centralbl. xi, pp. 200-212.

VOELTZKOW, A. Ueber die Ei-Ablage und Embryonal-Entwicklung der Krokodile. SB. Ak. Berlin (1891) pp. 115-120.

An interesting note on the call made by the young from within the buried eggs.

WASMANN, E. Parthenogenesis bei Ameisen durch künstliche Temperaturverhältnisse. Biol. Centralbl. xi, pp. 21-23.

During three successive winters artificial warming induced parthenogenesis in the workers of *Formica sanguinea* and their helpers, *F. fusca*. On one day twelve workers of *F. sanguinea* were seen laying eggs.

WEISMANN, A. Amphimixis oder die Vermischung der Individuen. Jena : 8vo, vi & 176 pp., 12 figs.

"Fertilisation has no significance, except the union in the single offspring of the hereditary substance from two individuals." "The essence of fertilisation is neither in the vitalisation of the egg, nor in the union of two opposed polar forces, but rather in the fusion of two hereditary tendencies—in the mingling of the peculiarities of two individuals." This is called amphimixis. "The formation of polar bodies is a process for the reduction of the hereditary substance." "The previous interpreting of the first polar body as the removal of ovogenetic nucleoplasm from the egg must fall to the ground." "The number of nuclear rods is doubled at the beginning of the reducing process, and must therefore be quartered if a diminution to one half of the normal number be the ultimate necessity." "The significance of the original increase of the chromatin rods to double their number lies in the attempt to bring about as intimate a mixture as possible of the hereditary units of both father and mother." "The significance of the longitudinal splitting and the consequent doubling of their number is an increase in the number of possible combinations." "In parthenogenetic as well as in sexual eggs a change may take place in the constitution of the germ-plasma during

successive generations." "I hold that a belief in the inheritance of acquired characters by the highly differentiated Protozoa, as well as by Metazoa, must be opposed, and I imagine that the phyletic modifications of Protozoa arise from the germ-plasma." "Amphimixis has arisen from the necessity of providing the process of natural selection with a continually changing material, by the combinations of individual characters." Amphimixis is no indispensable vital condition, no renewal of life or rejuvenescence; its rare or frequent repetition in the life-history is not determined by its physical nature but by the conditions of life; it is not more than an essential advantage in the maintenance and modification of species.

WHITMAN, C. O. Spermatophores as a means of hypodermic impregnation. *J. Morph.* iv, pp. 361-406, 1 pl.

## MAMMALIA.

BY

R. LYDEKKER, B.A., F.G.S.

THE work of the year 1891 has been unusually heavy for the Recorder, on account of the excessive number of new generic and specific names proposed for the Tertiary Mammals of South America—names which in many instances are scarcely published by one writer, when they are relegated to the rank of synonyms by another. In addition to the above, a number of new generic terms have been proposed for recent forms—the majority to replace preoccupied names, but a few for new types.

The great event of the year has been the full description of the new Marsupial, *Notoryctes*, from the deserts of Australia; but the discovery of a new type of African Gazelle (*Ammodorcas*), described by Mr. O. THOMAS, likewise calls for special notice. A circumstance which is perhaps unique in the annals of mammology, is the description of a new genus (*Trichomanis*) of living Mammals, of which the type and only known example has been lost.

KÜENTHAL's researches on the teeth of foetal Mammals—more especially Marsupials and Cetaceans—promise to revolutionize the prevalent ideas as to the relationship of the permanent with the deciduous dentition.

Among works calling for especial notice, we may refer to the completion of BLANFORD'S "Mammals of British India"; to W. L. SCLATER'S "Catalogue of Mammalia in the Indian Museum"; to the "Introduction to the Study of Mammals," by FLOWER and the present writer; and also to the third edition of "Brehm's Tierleben," in which the Mammals are completed. WEBER'S monograph of *Manis* may also be referred to as an exhaustive treatise on its subject.

Among fossil Mammals, F. MAJOR has made an important contribution to our knowledge of the *Giraffidæ*; while DÉPÉRET and LEMOINE in

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\* An asterisk prefixed to a quotation indicates that the Recorder has not seen the work referred to.

France, and E. T. NEWTON in England, have respectively published faunistic works treating of the extinct Mammals of certain horizons in the two countries. In spite of the serious drawbacks alluded to above, a great advance in our knowledge of the Tertiary fauna of South America has accrued from the publications of AMEGHINO, BURMEISTER, MERCERAT, and MORENO; the most important discoveries being the occurrence of Marsupials of Australian types, and of *Cebidæ*, in the lower Tertiaries of Argentina and Patagonia. In North America, attention may be especially directed to W. B. SCOTT's monograph of the genus *Poëbrotherium*, and the relation of the *Tylopoda* to other Ungulates; and also to his memoir on *Mesohippus* and *Leptomeryx*.

### I.—THE GENERAL SUBJECT.

ALLEN, J. A. Recent Work in North American Mammalogy. Tr. N. York Ac. Sci. x, pp. 71-85.

After giving a survey of the older literature on the subject, the author refers to the advantage of Trinomialism, and then proceeds to show how first of all the number of American species was reduced by regarding a large number of forms as varieties, while it has been subsequently largely increased by the acquisition of a number of what are said to be entirely new types.

——. Notes on a Collection of Mammals from Costa Rica. Bull. Am. Mus. Nat. Hist. iii, pp. 205-218.

The species noticed are 38 in number. The new forms are 1 *Blarina*, and 3 *Hesperomys*. [See *Soricidæ* and *Muridæ*.]

——. On a Collection of Mammals from Southern Texas and North-Eastern Mexico. T. c. pp. 219-228.

31 species are mentioned. These include a new variety of *Scalops* and a new *Dipodops*. [See *Talpidae* and *Geomyidæ*.]

——. Notes on New or Little known North-American Mammals. T. c. pp. 263-310.

A long paper, based on specimens in the Museum of Natural History. The genera referred to are *Heteromys*, *Dipodomys*, *Dipodops* (n. sp.), *Perognathus* (n. sp.), *Neotoma* (n. var.), *Sigmodon*, *Oryzomys* (n. sp.), *Hesperomys*, *Vesperimus* (n. sp.), *Sciurus*, *Lepus*, *Spilogale*, and *Felis*. The author follows Thomas in disregarding the name *Hesperomys*, but disputes its identity with *Cricetus*, and adopts instead *Vesperimus*, *Onychomys*, and *Oryzomys*, as distinct genera. On p. 294 the author states that the name *Hesperomys leucopus* is antedated by Kerr's name *americanus*. [No allusion is made to the discussion of this question by E. Coues, Am. Nat. 1879, p. 784.—R. L.] See *Muridæ* and *Geomyidæ*.

——. [See also p. 32, *Octodontidæ*.]



ALLEN, H. On the Influence Exerted by the Tongue on the Positions of the Teeth. P. Ac. Philad. 1891, p. 451.

It is considered that in cases where the tongue is used for prehension there has been a tendency to induce the lower incisors to become proclivous.

— [See also p. 23, *Vespertilionidæ*.]

AMEGHINO, F. Una rápida ojeada á la Evolucion Filogenética de los Mamíferos. Rev. Arg. Hist. Nat. i, pp. 17-28.

A review of the phylogenetical evolution of the extinct Mammals of Argentina.

— Sobre algunos restos de Mamíferos Fósiles, recogidos por el Señor Manuel B. Zavaleta en la Formacion Miocena de Tucuman y Catamarca. T. c. pp. 88-101, figures.

Describes and figures Mammalians obtained at Tucuman and Catamarca (N.-W. Argentina), from deposits which are regarded as of Miocene age. These comprise *Megamys formosus*, *Tetrastylus montanus* (n. sp.), *Typotherium* (?) *internum* (n. sp.), a new genus of *Megatheriidæ*, and *Plohophorus ameghinii*. [See *Chinchillidæ*, *Typotheriidæ*, and *Megatheriidæ*.]

— Las Antiguas Conexiones del Continente Sud-Americano y la Fauna Eocena Argentina. T. c. pp. 123-125.

The author insists on the impossibility of *Chalicotherium* being in any way intermediate between Ungulates and Edentates.

— Caracteres diagnósticos de Cincuenta, Especies Nuevas de Mamíferos Fósiles Argentinas. T. c. pp. 129-169, illustrated.

Comprises descriptions of a large number of new genera and species. *Macrauchenia* and its allies are taken to represent a distinct suborder of *Ungulata*—the *Litopterna*. Several interesting Creodonts are described and figured; as well as a large number of Edentates, and some Cetaceans. Especial interest attaches to the figure of the skull of the Toxodont genus *Acrotherium*, as showing the presence of 8 cheek-teeth, 5 of which appear to be premolars. [See *Creodonta*, *Sciuridæ*, *Octodontidæ*, *Chinchillidæ*, *Eocardiidæ*, *Caviidæ*, *Tillodontia*, *Toxodontia*, *Macraucheniidæ*, *Protheriidæ*, *Camelidæ*, *Balanidæ*, *Platanistidæ*, *Megatheriidæ*, and *Dasypodidæ*.]

— Mamíferos y Aves Fósiles Argentinas. Especies nuevas, adiciones y correcciones. T. c. pp. 240-259.

Notifies 68 species of Mammals, some of which are new; while several new generic names are proposed for preoccupied ones. Among these are new names for *Auchenia*, *Blastoceros*, *Schizodon*, and *Xenurus*; while it is urged that *Chelonischus* should be substituted for *Priodon*. It is shown that the presumed Edentate genus *Phororhacos* (= *Phorusrhacos*, Zool. Rec. xxiv, Mamm. p. 52) is really avian. [See *Octodontidæ*, *Chinchillidæ*,

*Caviidae*, *Typotheriidae*, *Toxodontidae*, *Elephantidae*, *Cervidae*, *Camelidae*, *Platanistidae*, *Delphinidae*, *Megatheriidae*, *Glyptodontidae*, *Dasypodidae*, and *Abderitidae*.]

[AMEGHINO, F.] Nuevos Restos de Mamíferos Fósiles, descubiertos por C. Ameghino en el Eoceno Inferior de la Patagonia Austral, &c. *Rev. Arg. Hist. Nat.* i, pp. 289-328.

Mentions 173 forms, of which a large number are described as new. Among the most noteworthy is a new genus of *Primates*, with a dental formula like that of the *Cebidae*. *Homalodontotherium* is stated to have limbs like those of the *Chalicotheriidae*. The most important circumstance in the paper is, however, the alleged occurrence of *Dasypuridae* in these beds; the author stating that he has evidence to show that these forms pass imperceptibly into the *Creodonta*, while the latter merge in the *Carnivora Vera*. [See *Primates*, *Necrolestidae*, *Creodonta*, *Hystriidae*, *Octodontidae*, *Eocardiidae*, *Typotheriidae*, *Amblypoda*, *Macraucheniidae*, *Homalodontotheriidae*, *Protheriidae*, *Megatheriidae*, *Dasypodidae*, *Glyptodontidae*, *Dasypuridae*, and *Multituberculata*.]

— Observaciones Criticas sobre los Mamíferos Eocenos de la Patagonia Austral. *T. c.* pp. 328-380.

A long critical paper, illustrated with figures, dealing largely with the Patagonian Mammals described by Mercerat. The chief conclusions are noticed under the headings of the genera and species to which they refer.

— [See also p. 22, *Cebidae*, p. 26, *Canidae*, p. 34, *Prottypotheriidae*, p. 35, *Typotheriidae*, p. 35, *Toxodontidae*, p. 39, *Homalodontotheriidae*, p. 39, *Equidae*, and p. 56, *Multituberculata*.]

BAKER, SIR S. W. *Wild Beasts and Their Ways*. 2nd ed. London: 1891, 8vo, 455 pp., illustrated.

BALLOWITZ, E. Weitere Beobachtungen ueber den Feineren Bau der Säugethierspermatozoen. *Z. wiss. Zool.* lii, pp. 217-293, pls. xiii-xv.

A continuation of the author's researches on the histology of Mammalian spermatozoa.

— Ueber das Vorkommen der Ehrlich'schen granulierten Zellen (Mastzellen) bei Winterschlafenden Säugetieren. *Anat. Anz.* vi, pp. 135-142.

BARTLETT, E. [See p. 40, *Rhinocerotidae*.]

BALAILLON, —. [See p. 51, *Myrmecophagidae*.]

BAUM, H. [See ELLENBERGER, p. 26, *Canidae*.]

BEDDARD, F. E. [See p. 22, *Lemuridae*, p. 33, *Caviidae*, p. 40, *Rhinocerotidae*, and p. 55, *Dasypuridae*.]

BEEVOR, C. E. [See p. 22, *Hapalidae*.]

BLANFORD, W. T. The Fauna of British India, including Ceylon and Burma. *Mammalia*, Pt. II. London & Calcutta: 8vo, pp. i-xx & 251-617, illustrated.

The completion of the work noticed in Zool. Rec. xxv, *Mamm.* p. 3, this part embracing the orders *Chiroptera*, *Rodentia*, *Ungulata*, *Cetacea*, *Sirenia*, and *Edentata*. The chief classificatory features calling for notice here are as follows:—In the Rodents the name *Microtus* is adopted instead of *Arvicola*; while in the Artiodactyle Ungulates the Tahr and Nilghri goat are separated from *Capra* as *Hemitragus jemlaicus* and *H. hylocrius*; the Goral is taken as representing a distinct genus, under the name of *Cemas goral*; and all the Bovines are included in the genus *Bos*. *Gazella fuscifrons* is regarded as a variety of *G. bennetti*.

BONNET, R. [See p. 39, *Equidæ*.]

BOTTI, U. La Grotta Ossifera di Cardamone in Terra d'Otranto. Bol. Soc. geol. Ital. ix, pp. 689-716, pl. xxvi.

Among the Mammals is a new variety of Mammoth (*Elephas primigenius*, var. *hydrantonus*), of which the molars are figured.

BOULE, M. Les Grands Animaux Fossiles de l'Amérique. Rev. Sci. 1891.

A section is devoted to the Mammals, and is reviewed in Rev. Arg. Hist. Nat. i, pp. 273 & 274.

BOUVIER, E. L. [See p. 48, *Physeteridæ*.]

BREHM'S Tierleben. 3rd ed. Säugetiere, by E. PECHUEL-LOESCHE. Leipsic: 1890-91, 8vo, 3 vols., illustrated.

BRYDEN, H. A. [See p. 43, *Giraffidæ*.]

BÜCHNER, E. Die Säugethiere der Ganssu-Expedition. Mém. biol. xiii, pp. 143-164. [See Zool. Rec. xxvii, *Mamm.* p. 3.]

— [See also p. 49, *Rhytinidæ*.]

BURMEISTER, H. [G.]. Adiciones al Examen Crítico de los Mamíferos Fósiles. An. Mus. B. Aires, iii, pp. 375-400, pl. vii.

*Eutemnodon americanus* is referred to *Hyænodon*; new species of *Felis*, *Oligobunis*, *Didelphys*, and *Loxomylus* are described. *Megamys* and *Colpodon* are also discussed; the latter being regarded as closely allied to *Nesodon* and *Homalodontotherium*. [See *Felidæ*, *Canidæ*, *Hyænodontidæ*, *Casteroididæ*, and *Didelphyidæ*.] A critical review is given in Rev. Arg. Hist. Nat. i, pp. 259-270.

— Continuacion de las adiciones al Examen de los Mamíferos Fósiles Terciarios. An. Mus. B. Aires, iii, pp. 401-461, pls. viii-x.

An important continuation of the author's critical researches into the structure and nomenclature of the fossil Mammals of Argentina, in the course of which the works of Ameghino and Mercerat are severely criticized. The first section deals with the genus *Nesodon*, in which the author recognizes only *N. imbricatus* and *N. ovinus*, including under these

species the genera *Acrotherium*, *Adinotherium*, and *Notohippus*, in addition to those identified with *Nesodon* by Ameghino (*infra*, p. 35). A cranium of *N. imbricatus* is figured, and the arrangement of the upper incisors shown to be different from that in Ameghino's figure. The next two sections deal with *Toxodon paranensis* and *T. parvus* (*Xotodon foricurvatus*, Ameghino). In the following section the author proposes the new generic name *Pachynodon*, in lieu of *Trigodon*, *Haplodontherium*, and *Trachypterus*, Ameghino, for another Toxodont. Among the Edentates the author shows that the genera *Promylodon* and *Promegatherium* are not separable from *Mylodon* and *Megatherium*, stating that the alleged occurrence of enamel in their teeth is erroneous. This is followed by the description of a new species of *Megalonyx* from Argentina. The memoir concludes with a notice of a Cetacean for which the new generic name *Saurodelphis* (in lieu of the preoccupied *Saurocetes*) is proposed.

—. Suplementos á las Diferentes Disertaciones. Publicadas Anteriormente. *T. c.* pp. 462-488.

A supplement to previous memoirs, followed by criticisms on various species described by other writers. The first part deals with the narial region of the Glyptodonts, the carapace of *Dedicurus*, and the tail of *Glyptodon*. This is followed by additional notes on the *Equidae*; after which are various genera and species belonging to a number of groups.

—. [See also p. 44, *Camelidae*.]

BURNE, R. H. [See p. 34, *Leporidae*.]

BÜTTIKOFER, J. Reisebilder aus Liberia. Leiden: 1890, 2 vols. 8vo, illustrated.

The second volume contains descriptions and figures of several West African Mammals.

CANTAMESSA, F. [See p. 36, *Proboscideu*.]

CAPELLINI, G. [See p. 48, *Physeteridae*.]

CHIARUGI, G. Osservazioni intorno alle Prime Fasce di Sviluppo dei Nervi Encefalici nei Mammiferi, e in particolare sulla Formazione del Nervo Olfattivo. *Monit. Zool. Ital.* ii, pp. 47-60, pl. i, and *Arch. Ital. Biol.* xv, pp. 418-425.

Observations on the early stages of the cerebral nerves, especially the olfactory, in Mammals.

CLAYPOLE, W. [See p. 49, *Megatheriidae*.]

COPE, E. D. On *Vertebrata* from the Tertiary and Cretaceous Rocks of the North-west Territory. I. The Species from the Oligocene or Lower Miocene beds of the Cypress Hills. *Contr. Canad. Pal.* iii, pp. 1-25, pls. i-xiv.

This memoir is chiefly devoted to Mammals, giving details of several species hitherto only known by preliminary notices. *Hemipsalodon* is considered to be in all probability generically identical with those species of *Pterodon* in which there are four lower premolars; its right to stand

as a genus being regarded as provisional. Full descriptions and illustrations are given of the various species of *Titanotherium* (*Menodus*) from these deposits, as well as of other *Perissodactyla* and *Artiodactyla*. [See *Titanotheriidae* and *Charopotamidae*.]

[COPE, E. D.] [See also p. 27, *Ursidae*, p. 37, *Macraucheniidae*, and p. 47, *Balenidae*.]

COUVREUR, —. [See p. 51, *Myrmecophagidae*.]

CROUCH, W. [See p. 47, *Balenidae*.]

CUNNINGHAM, D. J. [See p. 20, *Primates*.]

\*CZERSKY, J. Fossile Säugethierfauna der Nishniz-Udinsk. Schr. nat. Ges. Pétersb. xviii, pp. 66–70 (1889). [Omitted from Zool. Rec. xxvi.]

Describes remains of Mammoth, *Rhinoceros*, *Saiga*, and a new species of *Canis*. [See *Canidae*.]

DEPÉRET, C. H. Les Animaux Pliocènes du Roussillon. Mém. Soc. Géol. Pal., i, pp. 65–88, pls. xix & xx, and ii, pp. 89–104, pls. vii & viii.

The continuation of the memoir quoted in Zool. Rec. xxvii, *Mamm.* p. 4. The species described are *Mastodon arvernensis*, *Rhinoceros leptorhinus*, *Tapirus arvernensis*, *Hipparion crassum*, *Sus provincialis*, *Gazella borbonica*, *Palæoryx boëdon*, *Cervus ramosus*, and *U. (Capreolus) australis*.

— Sur l'existence d'une petite Faune de Vertébrés Miocènes dans les fentes de rochers de la vallée de la Saône, à Gray, et au Mont d'Or Lyonnais. C.R. cxii, pp. 1384 & 1385.

Describes a small fauna of Middle Miocene Mammals from these two localities; one of the species is new, and will be described as *Charomorus pygmeus*.

DE VIS, C. W. [See p. 54, *Phascolomyidae*, and *Nototheriidae*.]

DUBOIS, E. Voorloopig Bericht omtrent het onderzoek naar de Pleistocene en Tertiaire Vertebraten-Fauna van Sumatra en Java, gedurende het Jaar 1890. Tijdschr. Nederl. Ind. li, pp. 93–100.

The list of fossil Mammals from the Pleistocene of Sumatra and Java consists mainly of existing species, although including some which are extinct. Several of the forms from these deposits described by Martin as extinct are regarded as inseparable from living species.

DUVAL, M. [See p. 29, *Rodentia*.]

EARLE, C. [See p. 40, *Lambdotheriidae*.]

ELLENBERGER, W. [See p. 26, *Canidae*.]

EVANS, W. The Mammalian Fauna of the Edinburgh District. P. Phys. Soc. Edinb. xi, pp. 85–160.

Treats of the present and past history and distribution of 48 species, with notes on the habits of some.

FILHOL, H. Études sur les Mammifères Fossiles de Sansan. Ann. Sci. Géol. xxi, art. i, 319 pp., 46 pls.

The work quoted in Zool. Rec. xxvii, *Mamm.* p. 5, from another serial.

—. [See also p. 25, *Erinaceidae*, and p. 45, *Anthracotheriidae*.]

FLOWER, W. H. [See p. 40, *Equidae*.]

— & LYDEKKER, R. An Introduction to the Study of Mammals, Living and Extinct. London: 1891, 8vo, xvi & 763 pp., 357 woodcuts.

A systematic work, containing descriptions and references to all the well-established genera of existing as well as many extinct Mammals. A table of the classification of the orders and families is given on pp. 88-92. The illustrations include figures of the external form, and of the dentition, osteology, and viscera of a large number of types. A few emendations have been made on the authors' previous views as to the employment of certain generic terms, while some are used in a wider sense than formerly. Thus, *Neomeris* is included in *Phocæna*, and all the Oxen are ranged under *Bos*. A few new generic names have been proposed to replace preoccupied ones. [See *Phocidae*, *Pteropodidae*, *Emballonuridae*, and *Phyllostomatidae*.]

FLEISCHMANN, A. Die Grundform der Backzähne bei Säugethieren und die Homologie einzelnen Höcker. SB. Ak. Berlin, 1891, pp. 891-902, pl. vii.

Discusses recent theories as to the primitive plan of structure of Mammalian molars and the homologies of their various cusps. Also the theories as to the influence of pressure and position on the form and wearing of teeth.

—. [See also p. 25, *Carnivora*, and p. 29, *Rodentia*.]

FUSARI, —. Sulla Terminazione delle Fibree Nervose nelle Capsule Surrenali dei Mammiferi. Atti Acc. Tor. xxvi, pp. 374-388, figs.

GALIPPE, V. [See p. 36, *Proboscidea*.]

GAUDRY, A. Remarques sur Quelques Fossiles du Musée de Florence. Bull. Soc. Géol. (3) xix, pp. 228-230.

The opinion that *Aulaxinus* is identical with *Macacus* (*Inuus*) is disputed, and it is regarded as a form connecting the *Sennopithecinae* and *Cercopithecinae*, *Dolichopithecus* and *Mesopithecus* being placed with the former. In a discussion on the European Pliocene Hyænas, it is considered that too many species have been named. The paper concludes with an assertion of the right of the name *Machærodus* to supersede *Meganthæron*.

—. [See also p. 36, *Proboscidea*.]

GRABER, V. Die Entdeckungen von E. Ballowitz betreffend die Fibrilläre Structur der Spermatozoen-Geißel. Biol. Centralbl. x, pp. 721-731.

Criticisms and observations on Ballowitz's researches into the structure of the spermatozoa in Mammals and other Vertebrates.

- GREVÈ, C. [See p. 25, *Felidæ*, and p. 27, *Ursidæ*.]
- GÜNTHER, A. [See p. 30, *Myoxidæ*.]
- HARLE, E. [See p. 26, *Canidæ*.]
- HARTING, J. E. [See p. 23, *Vespertilionidæ*, p. 26, *Canidæ*, and p. 27, *Mustelidæ*.]
- HARTMANN, R. SB. nat. Fr. 1891, pp. 37–45, has remarks on a collection of Mammals made by R. Bohm in East Africa.
- HEDINGER, A. [See p. 21, *Cercopithecidæ*.]
- HEINRICHUS, F. [See p. 25, *Felidæ*.]
- HOLL, M. Sull' Omodinamia delle Cinture Scapolare e Pelvica. Monit. Zool. Ital. ii, pp. 123–135, figs.  
 Observations on the homology of the pectoral and pelvic girdles of Vertebrates, with especial reference to those of Man and *Echidna* among Mammals.
- HOWES, G. B. On the Probable Existence of a Jacobson's Organ among the *Orocodilia*; with Observations upon the Skeleton of that Organ in the *Mammalia*, and upon the Basi-Mandibular Elements in the *Vertebrata*. P. Z. S. 1891, pp. 148–159, pl. xiv.
- HUBRECHT, A. A. W. [See p. 51, *Edentata*.]
- HUET, J. [See p. 41, *Bovidæ*.]
- \*HUIDEKOPER, R. S. Age of the Domestic Animals, being a complete Treatise on the Dentition of the Horse, Ox, Sheep, Hog, and Dog, etc. Philadelphia and London: 1891, 8vo, illustrated.
- JEHL, —. Faune d'un Dépôt d'Ossements Quaternaire des Environs de Pouillenay (Côte-d'Or). C.R. cxii, pp. 1387–1389.  
 Records the occurrence of a number of species of existing Mammals in the deposits mentioned.
- JENTINK, F. A. Some Additions to the Mammalian Fauna of Billiton. Notes Leyd. Mus. xiii, pp. 207–209.  
 Records *Cercocebus cynomolgus*, *Semnopithecus maurus*, and a melanistic variety of *Tragulus napu*. A list of all the species known from the island is appended.
- On *Lepus netscheri*, Schlegel, *Felis megalotis*, Müller, and *Anoa santeng*, Dubois. T. c. pp. 217–222.  
 A second specimen of *F. megalotis* is recorded from Timor. Some subfossil skulls from Java, found by Dubois, are regarded as belonging to a small species of *Anoa*, which the finder thinks may be still existing in the island, and may be the santeng of the natives.
- [See also p. 22, *Chiroptera*, p. 32, *Octodontidæ*, and p. 46, *Suidæ*.]
- JHERING, H. [See p. 28, *Creodonta*.]
- JOUAN, H. [See p. 47, *Cetacea*.]

KAZZANDER, G. Sulla Radice Dorsale del Nervo Ipiglossso nell' Uomo e nei Mammiferi Domestici. *Anat. Anz.* vi, pp. 440-450, fig.

KEIFEL, F. [See p. 46, *Suidæ*.]

KITTL, E. Die Jungtertiären Säugethierfunde in der Mannersdorfer Ziegelei bei Angern. *Ann. Hofmuseum Wien*, vi, Notizen, pp. 92-97, woodcut.

Describes Pliocene Mammals from the banks of the river March, near Vienna. They include *Dinotherium giganteum*, *Mastodon*, a new *Amphicyon*, *Hipparion gracile*, and *Rhinoceros*. [See *Canidæ*.]

KLAATSH, H. [See p. 58, *Monotremata*.]

KLEBS, E. Zur Vergleichenden Anatomie der Placenta. *Arch. mikr. Anat.* xxxvii, pp. 335-356, pl. xvii.

A detailed account of the minute structure of the placenta.

KÜKENTHAL, W. Einige Bemerkungen über die Säugethierbezeichnung. *Anat. Anz.* vi, pp. 364-370.

—. Das Gebiss von *Didelphys*. *T. c.* pp. 658-668, figs.

Two very important papers, giving a preliminary account of the conclusions to which the author's observations have led him as to the homology and serial sequence of the teeth of various groups of Mammals. It is concluded that the hypothesis that the milk-dentition is the superadded one is untenable, and that this is really the primitive or first dentition, to which the permanent or second dentition has been added. The author's conclusions are derived from the following observations. Among the *Odontoceti* it is found that in the foetus there are traces of a replacing dentition which never come to maturity, and it is accordingly urged that the functional teeth of this group belong to the milk-series. Among the *Mystacoceti* (which are regarded as having a phylogeny totally distinct from that of the *Odontoceti*), it is shown that in the foetal teeth-germs the hinder ones are originally complex, and subsequently split up into simple teeth like those in the anterior part of the jaw; and it is therefore argued that the Cetacean dentition was originally heterodont. Traces of a deciduous set of teeth indicate that the aborted teeth of the *Mystacocetes* belong to the permanent series. The presence of milk-teeth in a species of *Dasypus* is held to prove that the Edentate dentition was originally diphyodont. More important than all, is the discovery of a series of rudimental successional teeth in embryos of *Didelphys*, which, taken in conjunction with the circumstance that all the teeth of Marsupials in advance of the true molars (with the exception of the replacing premolar), are developed from the superficial layer of tissue, is taken to prove that the whole of the Marsupial dentition (exclusive of the tooth referred to) belongs to the milk-series. It is further argued that the replacing tooth of the Marsupials is the third, and not the fourth premolar, as has been of late held to be the case.

LANGKAVEL, B. [See p. 32, *Octodontidae*, and p. 42, *Bovidae*.]



LATASTE, F. Des Variations de Durée de la Gestation chez les Mammifères, et des Circonstances qui Déterminent ces Variations ; Théorie de la Gestation Retardée. C.R. Soc. Biol. (9) iii, pp. 21-31.

Chiefly deals with the variability of the period of gestation in Rodents.

LECHE, W. [See *Marsupialia* and *Dasyuridæ*.]

LEMOINE, V. Étude d'Ensemble sur les Dents des Mammifères Fossiles des Environs de Reims. Bull. Soc. Géol. (3) xix, pp. 263-290, pls. x & xi.

A general review of the Mammals of the Cernaysienne and the overlying Ageienne fauna of the neighbourhood of Rheims, based on the characters of their dentition. Several new genera and species are described, but it is in some cases difficult to determine whether or no names appear for the first time. The new forms are recorded on p. 47, and under the heading *Multituberculata*, p. 57.

LENZ, H. [See p. 21, *Cercopithecidæ*.]

LINDAHL, H. [See p. 49, *Megatheriidæ*.]

LOCKHART, J. G. [See p. 43, *Cervidæ*.]

LUCAS, F. Animals Recently Extinct or Threatened with Extinction, as Represented in the Collections of the U. S. National Museum. Rep. U. S. Nat. Mus. 1888-89, pp. 609-649, pls. xcv-cv (1891).

The Mammals mentioned are *Monachus tropicalis*, *Macrorhinus angustirostris*, *Trichechus obesus*, *Bos bison*, and *Rhytina gigas*.

— Explorations in Newfoundland and Labrador in 1887, made in connection with the Cruise of the U. S. Schooner 'Grampus.' *T. c.* pp. 709-728.

Contains notes on the Seals and Cetaceans of these regions.

LYDEKKER, R. Catalogue of the Fossil Mammals, Birds, Reptiles, and Amphibians in the Science and Art Museum, Dublin. Dublin : 1891, 8vo, 61 pp.

— On a Collection of Mammalian Bones from Mongolia. *Rec. Geol. Surv. Ind.* xxiv, pp. 207-211, woodcuts.

Records remains of *Hyæna macrostoma*, *Gazella*, sp., *Equus sivalensis*, &c.

— [See also FLOWER & LYDEKKER, and p. 30, *Castoridæ*, p. 37, *Perissodactyla*, p. 42, *Bovidæ*, p. 43, *Giraffidæ*, p. 43, *Cervidæ*, p. 54, *Phascolomyidæ*, and p. 55, *Macropodidæ*.]

MAGGI, L. Fontanelle nello Scheletro Cephalico di Alcuni Mammiferi. *Rend. Ist. Lomb.* (2) xxiii, pp. 439-460 & 580-608, pls. v & vii-x.

A detailed memoir describing and figuring the cranial fontanelles in the young of a large number of Mammals.

— [See also p. 20, *Simiidæ*.]

MAJOR, C. J. FORSYTH. Considerations Nouvelles sur la Faune des Vértébrés du Miocène Supérieur dans l'Isle de Samos. C.R. cxiii, pp. 608-610.

The author gives a complete list of the Mammals from the Upper Tertiary of Samos, but as several of the names are new and are unaccompanied by any description, they must be regarded for the present as MS. ones. Among the forms of which there is some descriptive notice (although insufficient to allow of the names being established), there is an Antelope allied to the Gemsboks, for which the name *Protoryx* is proposed; while a Ruminant of generalized affinities receives the name of *Criotherium*. It is stated that the skull described as *Palæomanis* does not belong to an Edentate.

— Sur l'Age de la Faune de Samos. *T. c.* pp. 708-710.

The author brings forward evidence as to the contemporaneity of the faunas of Samos, Pikermi, Lebéron, Concud, Maragha, Baltavar, &c., and considers that these are probably older than the Siwalik fauna, which approximates to that of the Val d'Arno.

— [See also p. 43, *Giraffidæ*.]

MARSH, O. C. Note on Mesozoic Mammals. *Am. Nat.* xxv, pp. 611-616.

A reply to Osborn's criticisms (*infra*, p. 14). It is stated that none of the *Plagiaulacidæ* have three rows of tubercles in the upper molars, and that *Bolodon* is probably based on the upper jaw of *Plagiaulax*. Also that no *Allotheria* (*Multituberculata*) are known with certainty to have three rows of tubercles on the lower molars; the type of *Stereognathus* being probably part of the maxilla. It is urged that the type of *Meniscoessus* is Reptilian, but that *Stagodon* is truly Mammalian.

— Notice of new Vertebrate Fossils. *Am. J. Sci.* (3) xlii, pp. 265-269.

Includes 3 new species of *Titanotheriidae* (*q.v.*).

MARSHALL, W. [See p. 43, *Antilocapridæ*.]

MARTIN, P. [See p. 25, *Felidæ*.]

MATSCHE, P. Ueber einige Säugethiere von Kamerun und dessen Hinterlande. *Arch. f. Nat.* 1891, pp. 351-356.

A list of Mammals from the Cameroons and the districts to the interior thereof. *Alcelaphus* (*Bubalis*) *lehwel*, of Heuglin, is regarded as a distinct species. One new species of *Sciurus* is described. [See p. 29, *Sciuridæ*.]

MEARNS, E. A. [See p. 25, *Carnivora*, p. 27, *Mustelidæ*, and p. 29, *Sciuridæ*.]

MERCERAT, A. [See MORENO, and p. 28, *Creodonta*, p. 35, *Typotheriidae*, p. 35, *Toxodontidae*, p. 38, *Proterotheriidae*, p. 39, *Homalodontotheriidae*, and p. 49, *Edentata*.]

MERRIAM, C. H. The North American Fauna (U. S. Department of Agriculture). No. 5. Results of a Biological Reconnaissance of South Central Idaho ; and Descriptions of a New Genus and Two New Species of North American Mammals. 112 pp., 2 pls.

The list of Mammals from Idaho comprises 67 species and varieties, of which 10 species and 2 varieties are described as new. [See *Soricidae*, *Muridae*, *Geomysidae*, and *Leporidae*.]

METAXAS, C. Mémoire sur les Animaux de la Mesopotamie. Bull. Soc. Acclim. 1891, ii, pp. 321-328, 423-435, & 513-522, figs.

Chiefly relates to domesticated Mammals.

MILLER, G. S. [See p. 32, *Dipodidae*.]

MOORE, J. [See p. 33, *Castoroididae*.]

MORENO, F. P., & MERCERAT, A. Exploracion Arqueológica de la Provincia de Catamarca. Rev. Mus. La Plata, i, pp. 199-232, pl. ix.

Contains a description of 17 new species of Middle Tertiary Mammals. It is reviewed in Rev. Arg. Hist. Nat. i, pp. 199-207, where several of the species are considered to have been previously named. [See *Procyonidae*, *Typotheriidae*, *Macraucheniiidae*, *Protherotheriidae*, *Megatheriidae*, *Dasyopodidae*, and *Glyptodontidae*.]

MORRIS, A. W. [See p. 42, *Bovidae*.]

MULL, F. Development of the Lesser Peritoneal Cavity in Birds and Mammals. J. Morph. v, pp. 165-179, figs.

MUMMERY, J. H. Some Points in the Structure and Development of Dentine. P. R. S. xlviii, pp. 319-321 (Abstract).

Records appearances in dentine suggestive of its formation by a connective tissue calcification, thus indicating that the process is more like the formation of bone than hitherto supposed. Illustrations are adduced from several Mammals.

NAUMANN, E. [See p. 36, *Proboscidea*.]

NEHRING, A. Diluviale Reste von *Cuon*, *Ovis*, *Saiga*, *Ibex*, und *Rupicapra* aus Mähren. JB. Mineral. 1891, ii, pp. 107-155, pls. ii & iii.

Describes and figures remains of *Cyon*, Sheep, Saiga, Ibex, and Chamois from the Pleistocene of Moravia. The sheep is referred to a new species allied to the Argalis ; while the Saiga is likewise new, being distinguished from the existing species by its superior size, and the presence of three lower premolars. At the end of the paper some observations are added on *Ovis antiqua* and *Caprovius savigni*. It is considered that the presence of fossil remains of Chamois and Ibex in the plains of Europe indicates that these animals were driven from the mountains by cold. [See *Canidae* and *Bovidae*.]

—: Die Geographische Verbreitung der Säugethiere in dem Tschernosem-Gebiete des Rechten Wolga-Ufers in dem Angrenzenden Gebieten. Z. Ges. f. Erdkunde, xxvi, pp. 297-351, map.

[NEHRING, A.] Ueber neue Funde aus dem Gypsbruch von Thiede bei Braunschweig. SB. nat. Fr. 1891, pp. 78 & 79.

A preliminary notice of fossil Mammals from the Pleistocene of Brunswick.

——. Russische Säugetier-namen. Zool. Gart. xxxii, pp. 326–330.

A list of the Russian vernacular names of a number of Mammals.

——. [See also p. 26, *Canidae*, p. 32, *Hystricidae*, p. 34, *Caviidae*, p. 42, *Bovidae*, p. 44, *Cervidae*, and p. 46, *Suidae*.]

NEWTON, E. T. The Vertebrates of the Pliocene Deposits of Britain. Mem. Geol. Surv. 1891, 131 pp., 10 pls.

An important illustrated memoir forming a summary of all the work hitherto done on the subject of which it treats. The first 82 pp. are devoted to Mammals. No new species are recorded.

——. [See also p. 30, *Castoridae*.]

NITSCHKE, H. [See p. 44, *Cervidae*.]

NOACK, T. Beiträge zur Kenntniss der Säugetier-Fauna von Ostafrika. JB. Hamb. ix, pp. 1–88, pls. i & ii.

Describes a collection from the "Hinterland" of Pagani, and another from Egypt. The number of species catalogued is 69. *Colobus kirki* is fully described.

NOLL, F. C. [See p. 30, *Myoxidae*.]

NUTTING, C. C. [See p. 27, *Pinnipedia*.]

OGILBY, J. D. Hand-List of Australian Mammals. Sydney: 1891, 8vo, 16 pp., 1 fig.

The first instalment of a complete catalogue. The genus *Notoryctes* is made the type of a family *Notoryctidae*, which is placed in the Polyprotodont Marsupials, although the author regards it as a connecting link between that group and the *Monotremata*.

OSBORN, H. F. A Review of the Discovery of the Cretaceous *Mammalia*. P. Ac. Philad. 1891, pp. 1–12, woodcuts, and Am. Nat. xxv, pp. 595–611.

A criticism of Marsh's paper quoted in Zool. Rec. xxvi, *Mamm.* p. 10. The author concludes that in the *Multituberculata* (*Allotheria*) the genera *Cimolomys*, *Cimolodon*, *Nanomys*, and *Hallodon*, referred to 3 families, and of which 8 species have been described, should all be included in *Cimolomys*, of which there are 2 or 3 species, and that the genus belongs to the *Plagiaulacidae*. The genera *Dipriodon*, *Tripriodon*, and *Selenacodon*, which have been referred to 2 families, are regarded as belonging to Cope's *Meniscoessus*, which is placed in the *Stereognathidae*. *Allacodon*, *Camptomys*, and *Oracodon* are considered to be not improbably identical with *Cimolomys* or *Meniscoessus*. In the Carnivorous or Insectivorous types the determination of *Dryolestes* in these beds is considered uncertain; while *Didelphops*, *Cimolestes*, and *Pedionomys* are not definable. The teeth

described as *Stagodon* and *Flatacodon* are considered to be Reptilian or Ichthyopsidan. It is shown that the *Stereognathidæ* differ from the other *Multituberculata* in having two rows of tubercles in the upper and three in the lower molars, instead of the reverse arrangement. In *Am. Nat. t. c.* pp. 775-785, the author replies to an answer by Marsh (*suprà*, p. 12) on those criticisms.

PACKARD, A. S. The Labrador Coast. New York: 1891, 513 pp., illustrated.

Contains notices of the Seal-fishing, the Walrus, Polar Bear, and other Mammals; and has also a complete list of the Mammalian fauna.

PATERSON, A. M. The Development of the Sympathetic Nervous System in Mammals. P. R. S. xlviii, pp. 19-23 (Abstract).

The author concludes that the Mammalian sympathetic system is mesoblastic, and formed *in situ* out of the cellular tissue surrounding the embryonic aorta, and is at first independent of the cerebro-spinal system. Later on it becomes connected with the latter by means of growths from certain of the spinal nerves of white *rami communicantes*, and in consequence become gangliated in an irregular manner. From the main cord cellular outgrowths arise, which form peripheral, non-medullated nerves, plexuses, and ganglia, as well as the medullary portions of the supra-renal bodies. Morphologically the sympathetic system resembles the structures with which it is in contact in being mesoblastic, and primarily unsegmented.

PAVLOW, M. [See p. 40, *Equidæ*.]

PIANA, G. P. [See p. 41, *Artiodactyla*.]

POHLIG, H. (I) Ueber neue Ausgrabungen von Taubach, bei Weimar.

(II) Ueber Petersburger fossile Säugethierreste. (III) Ueber Amerikanische Proboscidierrreste. SB. niederrhein. Ges. 1891, pp. 38-42.

In the first communication remains of *Elephas antiquus* and *Rhinoceros mercki* are recorded from Weimar. In the second we have a record of various Mammals from Siberia, among which are an entire skeleton of *Elasmotherium*, a new type of *Canidæ*, *Bison priscus*, and *Ovibos moschatius*. Milk-tusks of Mammoth are also recorded. The third section chiefly relates to Cope's generic nomenclature of the *Proboscidea*.

— [See also p. 21, *Simiidae*, and p. 43, *Antilocapridæ*.]

— Die Grossen Säugethiere der Diluvialzeit. In Marshall's Zoologische Vorträge: Part 5, 64 pp. (1890).

A popular account of the giant Mammals of the Pleistocene.

POUCHET, G. [See p. 48, *Physeteridæ*.]

PRENANT, A. Annotations sur le Developpement du Tube Digestif chez les Mammifères. J. de l'Anat. Phys. xxvii, pp. 197-233, pls. xi-xiv.

PRIEM, F. L'Évolution der Formen Animales, avant l'Apparition de l'Homme. Paris: 1891, 12mo, 384 pp., illustrated.

The *Mammalia* occupy pp. 319-384.

REUVENS, C. L. [See p. 30, *Myoxidae*.]

RIESE, H. Die Feinsten Nervenfasern und ihre Endigungen im Ovarium der Säugethiere und des Menschen. *Anat. Anz.* vi, pp. 401-420.

\*ROGER, O. Ueber die Umbildungen des Säugethierskeletes, und die Entwicklungsgeschichte der Pferde. *Abh. Ver. Regensburg.* 1889, 35 pp. [Omitted from *Zool. Rec.* xxvi.]

RÖSE, C. Ueber das menschliche Gebiss. *Verh. Anat. Ges.* 1891, pp. 165-168; and Ueber die Entwicklung der Zähne des Menschen: *Arch. mikr. Anat.* xxxviii, pp. 447-491, pls. xxvii & xxviii.

Elaborate memoirs on the development of the dental structures in the earliest states of the human foetus; the second being fully illustrated.

RÜTIMEYER, L. Neuere Funde von Fossilen Säugethiern in der Umgebung von Basel. *Verh. Ges. Basel*, ix, pp. 420-424.

Notes on various Mammalian remains from near Basel.

RUGE, G. [See p. 21, *Simiidae*.]

SACCO, F. [See p. 48, *Delphinidae*.]

SCHOTTLÄNDER, J. Beitrag zur Kenntniss der Follikelatresie nebst einigen Bemerkungen über die unveränderten Follikel in den Eierstöcken der Säugethiere. *Arch. mikr. Anat.* xxxvii, pp. 192-238, pl. xi.

\*SCHULZE, E. Faunæ Hercynicæ Mammalia. *Schr. Ver. Harzes*, v, pp. 21-36 (1890).

SCLATER, P. L. [See p. 21, *Simiidae*, p. 25, *Felidae*, p. 42, *Bovidae*, p. 56, *Notoryctidae*.]

SCLATER, W. L. Catalogue of *Mammalia* in the Indian Museum, Calcutta: Part II. Calcutta: 1891, 8vo, 375 pp.

This part, which completes the work, includes the *Rodentia*, *Ungulata*, *Carnivora*, *Cetacea*, *Sirenia*, *Marsupialia*, and *Monotremata*. Keys are given to all the Indian species of the various genera.

SCOTT, W. B. On the Osteology of *Mesohippus* and *Leptomeryx*, with observations on the Modes and Factors of Evolution in the *Mammalia*. *J. Morph.* v, pp. 301-406, pls. xxii & xxiii.

In the first part of this memoir the author describes in detail the osteology of *Mesohippus bairdi*, which is considered to differ from *Anchitherium* by the absence of infolding in the crowns of the incisors. It is regarded as one of the ancestral forms of the Horse, while it is suggested that *Anchitherium* is off the direct line. The second part treats in the same manner of *Leptomeryx*, which is regarded as a generalized Traguline, with certain resemblances to the *Pecora*, which appear to have been independently acquired. The third section discusses some problems in evolution, among which especial attention is directed to the importance of "parallelism."

[SCOTT, W. B.] [See also p. 45, *Poebrotheriidae*.]

SEYDEL, O. [See p. 20, *Primates*.]

SHERBORN, C. D. On the Dates of the Parts, Plates, and Text of Schreber's "Säugethiere." P. Z. S. 1891, pp. 587-592.

SHIELDS, G. O. The Big Game of North America. London: 1890, 8vo, 581 pp. [Omitted from Zool. Rec. xxvii.]

A series of articles on the large Mammals by various writers, mainly treating the subject from the sporting aspect.

SHUFELDT, R. W. [See p. 44, *Cervidae*.]

SLADE, D. D. [See p. 52, *Dasypodidae*.]

SOMERVILLE, J. T. [See p. 30, *Muridae*.]

SQUINABOL, S. [See p. 45, *Anthracotheriidae*.]

STAURENGKI, C. Dell' Inesistenza di Ossa Pre- e Postfrontali nel Cranio Umano e dei Mammiferi, con un' appendice sulla quistione dell' Ossa Sfenotico dei Mammiferi. Milan: 1891, 105 pp., 5 pls.

Noticed in Monit. Zool. Ital. ii, p. 218. The author disputes the view that remnants of the pre- and postfrontals of the lower Vertebrates are to be met with in Mammals.

STEWART, C. [See p. 58, *Ornithorhynchidae*.]

STIRLING, E. C. [See p. 56, *Notoryctidae*.]

STRAHL, —. Ueber den Bau der Placenta. SB. Ges. Marb. 1890, pp. 13-18.

A third contribution, based on the researches of the author, to the structure and anatomy of the placenta.

SYMMINGTON, J. [See p. 21, *Simiidae*, and p. 58, *Ornithorhynchidae*.]

TANJA, T. Ueber die Grenzen der Pleurahöhlen bei den Primaten, und bei einigen Anderen Säugethieren. Morph. JB. xvii, pp. 145-197, pls. ix-xii.

A determination of the limits of the lung-cavities in Primates and some other Mammals, together with a record of their gradual increase in size in human foetuses of different ages.

TAVERNARI, L. [See p. 21, *Cercopithecidae*.]

TEGETMEIER, W. B. [See p. 56, *Notoryctidae*.]

THOMAS, O. On a Collection of Small Mammals made by Mr. F. J. Jackson in Eastern Africa. P. Z. S. 1891, pp. 181-187, pl. xv.

15 species are recorded, of which a *Nyctinomys*, *Otomys*, and *Rhizomys* are new. [See *Emballonuridae*, *Muridae*, and *Spalacidae*.]

—. Preliminary Diagnoses of Four New Mammals from East Africa. Ann. N. H. (6) vii, pp. 1 & 2.

Includes *Nyctinomys lobatus*, *Otomys jacksoni*, *Rhizomys annectans*, and *Cervicapra clarkiei*. [See *Emballonuridae*, *Muridae*, *Spalacidae*, and *Bovidae*.]

1891. [VOL. XXVIII.]

[THOMAS, O.] [See also p. 23, *Chiroptera*, p. 37, *Hyracoidea*, and p. 41, *Artiodactyla*.]

TORNIER, G. Ueber den Säugetier-Præhallux. Arch. f. Nat. 1891, pp. 112-204, pl. vii.

TROUESSART, E. Nuevas Exploraciones de los Yacimientos Fosilíferos de la Patagonia Austral. Rev. Arg. Hist. Nat. i, pp. 60-63.

A reprint of the paper quoted in Zool. Rec. xxvii, *Mamm.*, p. 17. The new names *Acrotherium stygium* (n. sp.) and *Notohippus toxodontoides* (n. g. & sp.) are unaccompanied by any definition.

— [See also p. 56, *Notoryctidae*.]

TRUE, F. W. [See p. 25, *Felidae*, and p. 31, *Muridae*.]

TURNER, SIR W. The Convolutions of the Brain; a Study in Comparative Anatomy. Arch. Anat. Phys., Abth. f. Anat. 1891, pp. 8-46, woodcuts.

An important address, illustrating the structure and complexity of the cerebral convolutions in the chief Mammalian groups.

TUCKERMANN, F. Observations on some Mammalian Taste-Organs. J. Anat. Phys. xxv, pp. 505-508.

Describes these organs in embryos or new-born young of *Mus*, *Arctomys*, and *Mephitis*.

WARD, H. L. [See p. 23, *Chiroptera*, p. 29, *Sciuridae*, and p. 31, *Muridae*.]

WEBER, M. [See p. 49, *Manidae*.]

WINDLE, B. C. A. [See p. 20, *Hominidae*.]

WINGÉ, H. [See p. 31, *Muridae*.]

WOODWARD, A. S. [See p. 57, *Plagiaulacidae*.]

WOODWARD, H. B., & NEWTON, E. T. Memorials of John Gunn; being some Account of the Cromer Forest-Bed and its Fossil Mammalia. Norwich: 1891, 8vo, 92 pp., 7 pls.

Contains illustrated notes by Gunn on certain of the Forest-bed Mammals, with lists of the Vertebrate fauna of that bed and of the Norwich Crag, by Newton.

WUNDERLICH, L. [See p. 23, *Pteropodidae*.]

YOUNG, J. On Mammalian Remains from Cresswell Crag Bone-Caves. Tr. Geol. Soc. Glasgow, ix, pp. 211 & 212.

Records *Hyæna crocuta*, *Rhinoceros antiquitatis*, Reindeer, and Horse.

ZANDER, R. [See p. 41, *Artiodactyla*.]

ZIETZ, A. [See p. 47, *Cetacea*.]

## II.—FAUNAS.

### A.—RECENT.

*Europe*. See EVANS (Scotland), p. 7; NEHRING (Russia), p. 13; SCHULZE (Germany), p. 16.

*Mesopotamia*. See METAXAS, p. 13.



*India.* See BLANFORD, p. 5.

*Malayana.* See JENTINCK, p. 9.

*Africa.* See BÜTTIKOFER, p. 6; HARTMANN, p. 9; MATSCHIE, p. 12; NOACK, p. 14; THOMAS, p. 17.

*Australia.* See OGILBY, p. 14; ZIETZ, p. 18.

*N. America.* See ALLEN, p. 2; LUCAS, p. 11; MERRIAM, p. 13; PACKARD, p. 15 (Labrador); SHIELDS, p. 17.

## B.—FOSSIL.

*Europe.* See CZERSKY (Russia), p. 7; DEPÉRET (France), p. 7; FILHOL (France), p. 8; JEHL (France), p. 9; LEMOINE (France), p. 11; KITTL (Austria), p. 10; MAJOR (Samos), p. 12; NEHRING (Moravia), p. 13; NEWTON (Britain), p. 14; RÜTIMEYER (Switzerland), p. 16.

*Asia.* See DUBOIS (Sumatra and Java), p. 7; LYDEKKER (Mongolia), p. 13.

*N. America.* See COPE, p. 6; SCOTT, p. 16.

*S. America.* See AMEGHINO, p. 3; BURMEISTER, p. 5; MERCERAT, p. 12; MORENO, p. 13.

*Australia.* See DE VIS, p. 54.

## III.—SPECIAL STRUCTURES, DEVELOPMENT, &c.

ABNORMALITIES.—See WINDLE, *Primates* (pollex); MAGGI, *Simiidæ* (dentition).

DENTITION.—See FLEISCHMANN, p. 8; GALIPPE, *Elephantidæ*; KÜKENTHAL, p. 10; MAGGI, *Simiidæ*; PIANA, *Artiodactyla*: RÖSE, p. 16; STEWART, *Ornithorhynchidæ*.

DEVELOPMENT & EMBRYOLOGY.—See BALLOWITZ, p. 4 (spermatozoa); BONNET, *Equidæ* (foetal membranes); BRUNE, *Leporidæ* (sternum); CHIARUGI, p. 6 (nerves); DUVAL, *Rodentia* (placenta); FLEISCHMANN, *Carnivora* (placenta); GRABER, p. 8 (spermatozoa); HEINRICHIUS, *Felidæ*; KLEBS, p. 10; KEIFEL, *Suidæ*; MARTIN, *Felidæ* (nerves); PATERSON, p. 15 (nerves); PRENANT, p. 15 (alimentary canal); SCHOTTLÄNDER, p. 16 (foetal membranes); STRAHL, p. 17 (placenta).

DIGESTIVE SYSTEM.—See FLEISCHMANN, *Rodentia*; PRENANT, p. 15; SYMINGTON, *Simiidæ*; TOEFFER, *Rodentia*; TAVERNARI, *Cercopithecidæ* (gustatory organs); TUCKERMANN (gustatory organs).

GLANDS.—See POUSARGUES, *Rodentia*.

HISTOLOGY.—See BALLOWITZ, p. 4 (spermatozoa); GRABER, p. 8 (spermatozoa); HEINRICHIUS, *Felidæ* (placenta); KÜKENTHAL, p. 10 (dentition); MUMMERY, p. 13 (dentine).

LUNGS.—See TANJA, p. 17.

MORPHOLOGY.—See LECHE, *Marsupialia* (marsupial bones); WINDLE, *Primates* (pollex).

MUSCLES.—See SEYDEL, *Primates*.

NERVES, BRAIN, &c.—See BEEVOR, *Hapalidæ*; CHIARUGI, p. 6; CUNNINGHAM, *Primates*; FUSARI, p. 8; KAZZANDER, p. 10; MARTIN, *Felidæ*; PATERSON, p. 15; RIESE, p. 16; SYMINGTON, *Simiidæ*; WALDEYER, *Simiidæ*.

OSTEOLOGY.—See HOLL, p. 9; MAGGI, p. 11, and *Simiidæ*; STAURENGKI, p. 17.

#### IV.—SPECIAL WORK.

(*Extinct groups and species are indicated by a †.*)

##### 1.—PRIMATES.

CUNNINGHAM, D. J. The Sylvian Fissure and the Island of Reil in the Primate Brain. *J. Anat. Phys.* xxv, pp. 286–291.

SEYDEL, O. Ueber den Serratus Posticus, und seine Lagebeziehung zum Obliquus Abdominis und Intercostalis Externus bei Prosimiern und Primaten. *Morph. JB.* xviii, pp. 35–75, pls. i & ii.

——. Ueber die Nasenhöhle der höheren Säugetiere und der Menschen. *T. c.* xvii, pp. 44–99, pls. iv–vi.

Observations on the form and relations of the nasal cavity in the Primates. It is observed that in these points the *Cebidæ* occupy an intermediate position between the *Lemuroidea* and the *Cercopithecidæ*.

##### A.—ANTHROPOIDEA.

###### a. HOMINIDÆ.

WINDLE, B. C. A. The Occurrence of an Additional Phalanx in the Human Pollex. *J. Anat. Phys.* xxvi, pp. 100–116, pl. ii.

Records a case in which the pollex of the right manus was triarthrous; while in the left it was also triarthrous, but approximated in form to the index digit, while there was an additional radial digit. It is concluded that the missing joint in the normal pollex is the first phalangeal. Also that the combination of a supernumerary pollex with a triarthrous digit separating it from the index gives a certain amount of support to Bardeleben's theory of the prepollex.

###### b. SIMIIDÆ.

MAGGI, L. Il Canale Cranio-Faringeo negli Antropoidei. *Rend. Ist. Lombardo* (2) xxiv, pp. 138–149, pl. i.

A comparison of the cranial canals named in *Anthropopithecus*, *Gorilla*, *Simia*, and *Hylobates*.

[MAGGI, L.] I Mesognati Asiatici nei Giovani Antropoidi. Rend. Ist. Lombardo (2) xxiv, pp. 993-998.

—. Sopra una Diminuzione Numerica dei Denti dell' Orango (*Simia satyrus*). T. c. pp. 586-593, pl. iv.

—. Intorno alla Forma Primitiva delle Ossa Nasali nell' Orango. T. c. pp. 808-820, pl. xvi.

The first paper describes a specimen wanting the second left upper incisor.

RUGE, G. Anatomisches über den Rumpf der Hylobatiden—Ein Beitrag zur Bestimmung der Stellung dieser Gattung in Systeme. In M. Weber's Zool. Ergebnisse einer Reise in Niederländisch Ost-Indian (Leiden : 1890-91), pp. 366-460, pls. xxii-xxv.

The author concludes that *Hylobates* has no direct genetic connection with the typical *Simiidae*, but that it indicates a more primitive type which had diverged at an earlier date from a group allied to the *Cercopithecidae*. Accordingly, it should be made the type of a distinct family.

SYMINGTON, J. On the Viscera of a Female Chimpanzee. P. Phys. Soc. Edinb. x, pp. 297-312, figs.

Describes and figures the brain, alimentary canal, and generative organs.

WALDEYER, W. Sylvische Furche und Reil'sche Insel des genus *Hylobates*. SB. Ak. Berlin, 1891, pp. 265-277, pl. ii.

A description of the Sylvian fissure and 'Island of Reil' in the brain of the Gibbons, which are shown to be formed on the same essential plan as in Man.

\* *Simia morio*, note on ; P. L. SCLATER, P. Z. S. 1891, p. 301.

† *Dryopithecus fontani* : H. POHLIG, SB. niederrhein. Ges. 1890, p. 107, criticizes Gaudry's conclusions as to its affinity, and refers to a cranium from Eppelsheim, described by Kaup.

### c. CERCOPITHECIDÆ.

HEDINGER, A. Ueber den Pliocänen Affen der Heppenlochs. JB. Mineral. 1891, i, pp. 169-177, pl. iv.

Describes and figures a jaw from the Pliocene of Heppenlochs, which is regarded as indicating a new species, for which the undermentioned name is proposed.

† *Imius suevicus*, n. sp., HEDINGER, l. c. p. 176, Pliocene, Switzerland.

LENZ, H. Einiges ueber das Freileben der Nasenaffen (*Nasalis larvatus*). Zool. Gart. xxxii, pp. 216-218.

TAVERNARI, L. Contributo all' Anatomia degli Organi del Gusto.—La Lingua del *Cercopithecus diana*. Atti Soc. Mod. Mem. (3) x, pp. 23-34, pl. i.

For the affinities of *Aulaxinuus*, see GAUDRY, *suprà*, p. 8.

## d. CEBIDÆ.

AMEGHINO, F. Los Monos Fósiles de la República Argentina. Rev. Arg. Hist. Nat. i, pp. 383-397, figs.

Describes and figures remains of small *Primates* from the Lower Tertiary (Eocene) of Patagonia. These appear to have the dental formula of the *Cebidæ*, and are remarkable for the almost vertical direction of the anterior surface of the symphysis menti. It is considered that these early *Primates* exhibit marked signs of affinity with the *Protypotheriidae*—a family closely allied to the Toxodont *Typotheriidae*, but with all the teeth in mutual apposition, the terminal phalanges unguiculate, and the hallux and pollex opposable.

↓ † *Homunculus patagonicus*, n. g. & sp., AMEGHINO, *t. c.* pp. 290 & 384-386, figs., Low. Tertiary, Patagonia.

↓ † *Ecphantodon ceboides*, n. g. & sp., MERCERAT, Rev. Mus. La Plata, ii, p. 74, Low. Tertiary, Patagonia; identified by AMEGHINO, *op. cit.* p. 384, with preceding.

↓ † *Anthropops perfectus*, n. g. & sp., AMEGHINO, *op. cit.* pp. 387-389, figs., *ibid.*

↓ † *Homocentrus argentinus*, n. g. & sp., AMEGHINO, *t. c.* pp. 389-391, figs., *ibid.*

↓ † *Eudiastus lingulatus*, n. g. & sp., AMEGHINO, *t. c.* pp. 391 & 392, figs., *ibid.*

## e. HAPALIDÆ.

BEEVOR, C. E. On the Course of the Fibres of the Cingulum and the Posterior Parts of the Carpus callosus, and of the Fornix in the Marmoset Monkey. P. R. S. xlviii, pp. 271-273 (Abstract).

## B.—LEMUROIDÆ.

## f. LEMURIDÆ.

BEDDARD, F. E. Additional Notes upon *Hapalemur griseus*. P. Z. S. 1891, pp. 449-461, figs.

After calling especial attention to the patch of spines near the arm-gland, and to the characters of the cæcum in this and other Lemurs, the author describes the brain, and the myology of the limbs.

## 2. CHIROPTERA.

JENTINK, F. A. Some Observations relating to *Cynopterus brachyotis*, Müller, and *Kerivoula pellucida*, Waterhouse. Notes Leyd. Mus. xiii, pp. 202-206.

THOMAS, O. Descriptions of Three New Bats in the British Museum.  
Ann. N. H. (6) vii, pp. 527-530.

The species belong to *Hipposiderus*, *Vesperugo*, and *Stenoderma* (*vide infra*).

WARD, H. L. Description of Three New Species of Mexican Bats.  
Am. Nat. xxv, pp. 743-753, figs. (*vide infra*).

## A.—MEGACHIROPTERA.

### a. PTEROPODIDÆ.

WUNDERLICH, L. Die Fortplanzung der Flughunde (*Cynonycteris collaris*, Ill., and *Pteropus medius*, Temm.) in Zoologischen Garten zu Koln. Zool. Gart. xxxii, pp. 78-82.

† *Carponycteris*, n. n., LYDEKKER, Study of Mammals, p. 654 ; to replace *Macroglossus*, F. Cuv.

† *Trygenycteris*, n. n., LYDEKKER, *t. c.* p. 655 ; to replace *Megaloglossus*, Pagenstecher.

## B.—MICROCHIROPTERA.

### b. RHINOLOPHIDÆ.

† *Hipposiderus pratti*, n. sp., THOMAS, Ann. N. H. (6) vii, pp. 527 & 528, Szechuen, China.

† *Phyllorhina* (= *Hipposiderus*) *commersoni*, n. var. *thomensis*; DU BOGAGE, J. Sci. Lisb. (2) vi, p. 88, I. of St. Thomas.

### c. VESPERTILIONIDÆ.

† *Histiotus maculatus*, n. sp., J. A. ALLEN, Bull. Am. Mus. Nat. Hist. iii, pp. 195-198, S. California. A parti-coloured species, which is the only representative of this group of *Vesperugo* beyond S. America.

† *Euderma maculatum*, n. g., H. ALLEN, P. Ac. Philad. 1891, pp. 467-470 ; type *Histiotus maculatus*.

† *Vesperugo* (*Vesperus*) *moloneyi*, n. sp., THOMAS, Ann. N. H. (6) vii, pp. 528 & 529, Lagos, W. Africa.

† *Vesperugo vera-crucis*, WARD, Am. Nat. xxv, p. 745, Mexico.

HARTING, J. E. The Serotine, *Vesperugo serotinus*. Zool. (3) xv, pp. 201-205, pl. i.

### d. EMBALLONURIDÆ.

† *Mystacops*, n. n., to replace *Mystacina*, Gray ; LYDEKKER, Study of Mammals, p. 671.

† *Nyctinomus lobatus*, n. sp., THOMAS, Ann. N. H. (6) vii, p. 1, and

P. Z. S. 1891, pp. 182 & 183, woodcut, Turquel, Sük, inland British E. Africa.

✓ *Nyctinomus depressus*, n. sp., WARD, Am. Nat. xxv, p. 747, fig., Mexico.

✓ *Centurio minor*, n. sp., WARD, t. c. p. 750, fig., Mexico.

#### e. PHYLLOSTOMATIDÆ.

✓ *Otopterus*, n. n., LYDEKKER, Study of Mammals, p. 673; to replace *Macrotus*, Gray.

✓ *Anthorhina*, n. n., LYDEKKER, t. c. p. 674; to replace *Tylostoma*, Gervais.

✓ *Leptonycteris*, n. n., LYDEKKER, t. c.; to replace *Ischnoglossa*, Saussure.

✓ *Vampyrops zarhinus*, n. sp., H. ALLEN, P. Ac. Philad. 1891, pp. 400–405, Brazil.

✓ *Molossus fluminensis*, n. sp., LATASTE, Ann. Mus. Genov. (2) x, pp. 658–664, woodcuts, Rio Janeiro.

✓ *Stenoderma nichollsi*, n. sp., THOMAS, Ann. N. H. (6) vii, pp. 529 & 530, Dominica, W. Indies.

✓ *Chiroderma dorieæ*, n. sp., THOMAS, Ann. Mus. Genov. (2) x, pp. 881–883, Minas Geraes, Brazil. Based on the specimen described by Dobson as *C. villosum*; a specimen really belonging to the latter having been recently obtained from Venezuela.

### 3. INSECTIVORA.

DOBSON, G. E. Note on the Derivation and Distribution of the *Insectivora* of the New World. P. Z. S. 1891, pp. 349–351.

The occurrence of *Soriculus* in China is incidentally mentioned.

#### a. SORICIDÆ.

*Sorex idahoensis*, n. sp., p. 32, *dobsoni*, n. sp., p. 33, Idaho, MERRIAM, North American Fauna, No. 5 (*suprà*, p. 13).

*Sorex vagrans*, n. var. *similis*, MERRIAM, t. c. p. 34, *ibid.*

*Blarina costaricensis*, n. sp., J. A. ALLEN, Bull. Am. Mus. Nat. Hist. iii, pp. 205 & 206, Costa Rica. The only representative of the genus with 32 teeth found south of the United States.

#### b. TALPIDÆ.

*Scalops argentatus*, n. var. *texanus*, J. A. ALLEN, Bull. Am. Mus. Nat. Hist. iii, p. 221, Texas.

✓ [*Talpa*] *Mogera robusta*, n. sp., NEHRING, SB. nat. Fr. 1891, pp. 95–103, Vladivostock, Siberia.

✓ *Talpa europæa*: F. DAHL, Zool. Anz. xiv, pp. 9–11, has notes on its food.

## c. ERINACEIDÆ.

- † *Palæoerinaeus cayluxi*, n. sp., FILHOL, Bull. Soc. Philom. (8) iii, pp. 92 & 93, fig., Oligocene, Caylux.

## d. NECROLESTIDÆ.

- † *Necrolestes patagonensis*, n. g. & sp., AMEGHINO, Rev. Arg. Hist. Nat. i, p. 303, Low. Tertiary, Patagonia.

## 4. CARNIVORA.

FLEISCHMANN, A. Entwicklung und Structur der Placenta bei Raubthieren. SB. Ak. Berlin, 1891, pp. 661-670.

The author's investigations lead to the conclusion that the zonary placenta of the Carnivores is morphologically and histologically different from the discoidal placenta.

## A.—CARNIVORA VERA.

MEARNS, E. A. Description of a New Species of Weasel, and a New Subspecies of the Grey Fox, from Arizona. Bull. Am. Mus. Nat. Hist. iii, pp. 234-238.

[See *Canidæ* and *Mustelidæ*.]

## a. FELIDÆ.

GREVÉ, C. Uebersicht der Geographischen Verbreitung jetzt lebenden Feliden. Zool. Jahrb. vi, pp. 59-102, pls. ii-v.

A detailed notice of the distribution of all the living *Felidæ*, illustrated with maps.

HEINRICHIUS, F. Ueber die Entwicklung und Structur der Placenta bei der Katze. Arch. mikr. Anat. xxxvii, pp. 357-374, pls. xviii & xix.

Observations on the development and histology of the Cat's placenta.

MARTIN, P. Die Entwicklung des Neunten bis Zwölften Kopfnerven bei der Katze. Anat. Anz. vi, pp. 228-232.

TRUE, F. W. The Puma, or American Lion (*Felis concolor* of Linnæus). Rep. U. S. Nat. Mus. 1889, pp. 591-608, pl. (1891).

A general account of its form, distribution, and habits.

• *Felis uncia*: P. L. SCLATER, P. Z. S. 1891, pp. 197 & 212, has notes on its distribution and on a living specimen exhibited in London.

• *Felis tigris*, an albino recorded by H. SAUNDERS, P. Z. S. 1891, p. 373.

• † *Felis propampina*, n. sp., H. BURMEISTER, An. Mus. B. Aires, iii, pp. 377 & 378, Tertiary, Argentina.

## b. PROTELEIDÆ.

- *Proteles cristatus* recorded by THOMAS, P. Z. S. 1891, p. 207, from Somaliland.

## c. VIVERRIDÆ.

- *Herpestes mungo* : ST. JOHN, P. Z. S. 1891, p. 245, notes its breeding in captivity.

## d. CANIDÆ.

AMEGHINO, F. Sobre algunas especies de Perros Fósiles de la República Argentina. *Rev. Arg. Hist. Nat.* i, pp. 438-441, figs.

Describes and figures a jaw of *Canis protojubatus*, and also some new species (*infra*).

ELLENBERGER, W., & BAUM, H. Systematische und Topographische Anatomie des Hundes. Berlin : 1891, 8vo, 650 pp., 208 figs.

An elaborately detailed anatomy of the Dog, as required for veterinary purposes, and medical experiments. Reviewed in *Nature*, xlv, pp. 16-18.

• HARLE, E. Sur les Mandibules d'un Canidé du genre *Cuon*. *Arch. d'Anthrop.* 1891, ii, pp. 129, *et seq.*

Describes a mandible from the cave of Malarnaud, Ariège (*infra*).

HARTING, J. E. The Fox, *Vulpes vulgaris*. *Zool.* (3) xv, pp. 321-334, pl. ii.

NEHRING, A. Ueber die ehemalige Verbreitung der Gattung *Cuon* in Europa. *SB. nat. Fr.* 1891, pp. 75-78.

A summary of all the recorded instances of the occurrence of this group of *Canidæ* in the European Pleistocene, &c.

• *Canis adustus* : SHÄFF, *SB. Ak. Wien*, 1891, pp. 246-251, regards this species (= *C. lateralis*) as a true Jackal.

*Canis (Urocyon) virginianus*, n. var. *scotti*, MEARNs, *t. c.* (*suprà*, p. 25), pp. 236-238, Arizona.

• †*Canis platensis*, n. sp., MERCERAT, *Rev. Mus. la Plata*, ii, p. 83, Up. Tertiary, Buenos Ayres; changed to *C. palæoplatensis*, by AMEGHINO, *Rev. Arg. Hist. Nat.* i, p. 441, on account of preoccupation.

†*Canis proplatensis*, AMEGHINO, *t. c.* p. 439, fig. 99, Up. Tertiary, La Plata.

• †*Canis nischneudensis*, n. sp., CZERSKY, *Schr. nat. Ges. Petersb.* xviii, pp. 66, *et seq.*, Pleistocene, Russia (1889).

†*Cyon europeus*, recorded by NEHRING (*suprà*, p. 13), from the Pleistocene of Moravia; see also preceding paper.

†*Cyon bourreti*, n. sp., HARLÈ, *t. c.*, cavern, Malarnaud, France. See also NEHRING, *SB. nat. Fr.* 1891, pp. 91-95, woodcut.

• †*Oligobunis argentina*, n. sp., BURMEISTER, *An. Mus. B. Aires*, iii, p. 378, pl. vii, fig. 2, Tertiary, Argentina.

• †*Amphicyon gutmanni*, n. sp., KITTL, *Ann. Hofmuseum Wien*, vi, Notizen, pp. 95 & 96, fig., Pliocene, Austria.



## e. URSIDÆ.

GREVÉ, C. Der Bär in Europäischen Russland. Zool. Gart. xxxii, pp. 202-212.

• † *Arctotherium simum*: skull described and figured; COPE, Am. Nat. xxv, pp. 997-998, pl. xxi.

## f. MUSTELIDÆ.

HARTING, J. E. The Polecat, *Mustela putorius*. Zool. (3) xv, pp. 281-294, pl. iii.

— The British Marten, *Martes sylvatica*. T. c. pp. 401-409 & 450-459, pl. iv.

MEARNS, E. A. Observations on the North American Badgers, with especial reference to the Forms found in Arizona, with description of a new Subspecies from Northern California. Bull. Am. Mus. Nat. Hist. iii, pp. 239-251.

— Notes on the Otter (*Lutra canadensis*) and Skunks (Genera *Spilogale* and *Mephitis*) of Arizona. T. c. pp. 252-262.

SCHACT, H. Die Raubsäugethiere des Teutoburger Walder—Das Kleine Wisel (*Mustela vulgaris*). Zool. Gart. xxxiii, pp. 146-149.

*Putorius arizonensis*, n. sp., MEARNS, t. c. (*suprà*, p. 25), pp. 234 & 235, Arizona.

*Taxidea americana*, n. var. *neglecta*, MEARNS, t. c. pp. 250 & 251, N. California.

*Spilogale phenax*, n. var. *arizonæ*, MEARNS, t. c. pp. 256-258, Arizona.

• *Meles* (cf. *amurensis vel schrenki*): notes on skulls from Vladivostock; NEHRING, SB. nat. Fr. 1891, pp. 103-108.

## g. PROCYONIDÆ.

• † *Amphinasua brevirostris*, n. g. & sp., MORENO & MERCERAT, Rev. Mus. la Plata, i, p. 231, pl. ix, Tertiary, Catamarca; Identified by AMEGHINO, 'Rev. Arg. Hist. Nat.' i, pp. 204-207, with *Cynonasua argentina*, Ameg., of which the skull is figured.

## B.—PINNIPEDIA.

NUTTING, C. C. Some of the Causes and Results of Polygamy among the *Pinnipedia*. Am. Nat. xxv, pp. 103-112. [See also t. c. pp. 495 & 496.]

SOUTHWELL, T. W., Zool. (3) xv, pp. 121-126, has notes on the Seal fishery of 1890.

For various notes on Seals, see LUCAS, *anted*, p. 11.

## h. PHOCIDÆ.

↓ *Pæcillophoca*, n. n., LYDEKKER, Study of Mammals, p. 605, to replace *Leptonyx*, Gray. [The name *Leptonychotes* had, however, been previously proposed by GILL, Smiths. Misc. Coll. xi, p. 70 (1872); not recorded in Zool. Rec. ix.]

## †C.—CREODONTA.

JHERING, H. Sobre la Distribucion Geográfica de los Creodontes. Rev. Arg. Hist. Nat. i, pp. 209–213. Addendum to same by F. AMEGHINO. T. c. pp. 214–219.

After a discussion of the European Creodonts, it is strongly urged that the Pampean fauna of South America is Pliocene, and not Pleistocene.

MERCERAT, A. Caracteres Diagnósticos de Algunas Especies de *Creodonta* conserdavas en el Museo de La Plata. Rev. Mus. la Plata, ii, pp. 51–56.

Notes and descriptions of Creodont remains from the South American Tertiaries (*vide infra*).

## i. †HYÆNODONTIDÆ.

↓ †*Achlysictis lelongi*, n. g. & sp., AMEGHINO, Rev. Arg. Hist. Nat. i, pp. 147 & 148, Tertiary, Parana.

↓ †*Dynamicitis fera*, n. g. & sp., AMEGHINO, t. c. pp. 148 & 149, Tertiary, Patagonia.

↓ †*Eutemnodus americanus* identified with *Hyænodon* by BURMEISTER (*suprà*, p. 5).

↓ †*Arctodictis munizi*, n. g. & sp., MERCERAT, Rev. Mus. la Plata, ii, p. 51, Tertiary, Patagonia. Identified by AMEGHINO, Rev. Arg. Hist. Nat. i, p. 354, with *Dynamicitis fera*.

↓ †*Arctodictis australis*, n. sp., MERCERAT, t. c. p. 52, *ibid*.

## k. †PROVIVERRIDÆ.

↓ †*Proviverra trouessarti*, n. sp., AMEGHINO, Rev. Arg. Hist. Nat. i, pp. 149 & 150, Tertiary, Patagonia.

↓ †*Cladosistis dissimilis*, n. g. & sp., MERCERAT, *op. cit.* p. 51, *ibid*. Identified by AMEGHINO, Rev. Arg. Hist. Nat. i, p. 354, with the above.

## FAMILY UNCERTAIN.

[Some of the following may prove to be Marsupials.]

↓ †*Conodonictis sævus*, n. g. & sp., AMEGHINO, Rev. Arg. Hist. Nat. i, p. 314, Low. Tertiary, Patagonia.

↓ †*Conodonictis exterminator*, n. sp., AMEGHINO, l. c., *ibid*.

† *Sipalocyon pusillus*, n. sp., AMEGHINO, Rev. Arg. Hist. Nat. i, p. 315, Low. Tertiary, Patagonia.

† *Ictioborus fenestratus*, n. g. & sp., AMEGHINO, *l. c.*, *ibid.*

† *Hathliacynus fischeri*, p. 52, † *cultridens*, † *rollieri*, † *lynchi*, † *kobyi*, p. 53, n. spp., Low. Tertiary, Patagonia, MERCERAT, Rev. Mus. la Plata, i.

† *Agustylus carnifex*, † *primævus*, n. spp., MERCERAT, *l. c.*, p. 54, *ibid.*

† *Thylacodictis exilis*, n. g. & sp., MERCERAT, *l. c.*, *ibid.* Identified by AMEGHINO, Rev. Arg. Hist. Nat. i, p. 354, with *Sipalocyon gracilis*.

† *Acrocyon equianus*, † *patagonensis*, n. spp., Rev. Mus. la Plata, ii, p. 55, *ibid.*

† *Theriodictis platensis*, n. g. & sp., MERCERAT, *l. c.*, *ibid.* Identified by AMEGHINO, Rev. Arg. Hist. Nat. i, p. 354, with *Macrocyon*.

## 5. RODENTIA.

DUVAL, M. Le Placenta des Ronguers. J. de l'Anat. Phys. xxvii, pp. 24-73 & 314-395, pls. i-iv & xv-xviii.

The continuation of the memoir quoted in Zool. Rec. xxvii, Mamm. p. 32.

FLEISCHMANN, A. Bemerkungen über den Magen der Rodentia. Morph. JB. xvii, pp. 408-416.

Supplemental observations referring to the paper by Toepfer, quoted below.

POUSARGUES, E. Glandes annexes de l'Appareil Génital Mâle de la Gerboise Mauritanie. Bull. Soc. Philom. (8) iii, pp. 128-132.

TOEPFER, K. Die Morphologie des Magens der Rodentia. Morph. JB. xvii, pp. 380-407, pl. xxiv.

A comparison of the structure of the stomach in a number of genera of Rodents.

## a. SCIURIDÆ.

MEARNS, E. A. Description of a New Subspecies of the Eastern Chipmunk, from the Upper Mississippi Region, West of the Great Lakes. Bull. Am. Mus. Nat. Hist. iii, pp. 229-233.

*Tamias striatus*, n. var. *griseus*, MEARNS, *l. c.* p. 231.

• *Sciurus auriculatus*, n. sp., MATSCHIE, Arch. f. Nat. 1891, p. 355, Cameroons.

† *Haplostropha scalabriniana*, n. g. & sp., AMEGHINO, Rev. Arg. Hist. Nat. i, Tertiary, Parana.

• *Arctomys bobac*, SCHÄFF, Arch. f. Nat. 1891, pp. 239-244, contrasts its skeleton with that of *A. marmotta*.

• NEHRING, SB. nat. Fr. 1891, pp. 175-177, has notes on remains of *Spermophilus* from Bourg, in the Gironde.

• *Spermophilus sonoriensis*, n. sp., WARD, Am. Nat. xxv, pp. 158-160, Mexico.

## b. MYOXIDÆ.

GÜNTHER, A. Die Gartenschläfer, *Myoxus quercinus*, im Rheinthale. Zool. Gart. xxxii, pp. 82 & 83.

NOLL, F. C. Die Gartenschläfer (*Myoxus nitela*, Schrbr., = *Eliomys quercinus*, Linn.) in Rheinthale bei St. Goar. T. c. pp. 7-12.

RÆUVENS, C. L. Einiger über die *Myoxidæ*, oder Schläfer. Notes Leyd. Mus. xiii, pp. 65-76, pl. v.

Supplemental notes to the memoir quoted in Zool. Rec. xxvii, *Mamm.* p. 35, with figure of the type of *Eliomys kelleni*.

## c. CASTORIDÆ.

LYDEKKER, R. The Present Distribution of the Beaver. Field, lxxvii, p. 9.

NEWTON, E. T. On a Skull of *Trogontherium cuvieri* from the Forest-bed of East Runton, near Cromer. P. Z. S. 1891, pp. 247 & 248 (Abstract).

The skull described admits of defining the generic distinctions between *Castor* and *Trogontherium*; *Conodontes*, of the French Pliocene, is identified with the latter.

## d. MURIDÆ.

ALLEN, J. A. Descriptions of Two supposed New Species of Mice from Costa Rica and Mexico, with remarks on *Hesperomys melanophrys* of Coues. P. U. S. Nat. Mus. xiv, pp. 193-196 (*vide infra*).

CLARKE, W. E., & BARRETT-HAMILTON, E. H. On the Identity and Distribution of the Irish Rat (*Mus hibernicus*, Thompson). Zool. (3) xv, pp. 1-9, figs.

It is concluded that this Rat is a melanistic form of *M. decumanus*.

SOMERVILLE, J. T. Notes on the Lemming (*Myodes torquatus*). P. Z. S. 1891, pp. 655-658.

Observations on the migratory habits of these animals.

*Otomys jacksoni*, n. sp., THOMAS, Ann. N. H. (6) vii, p. 2, and P. Z. S. 1891, pp. 184 & 185, pl. xv, Mt. Elgon, East Africa.

*Onychomys leucogaster*, n. var. *brevicaudus*, MERRIAM, North American Fauna (*suprà*, p. 13), No. 5, p. 52, Idaho.

*Hesperomys crinitus*, n. sp., MERRIAM, t. c. p. 53, *ibid*.

*Hesperomys (Vesperimus) cherrii*, n. sp., J. A. ALLEN, Bull. Am. Mus. Nat. Hist. iii, pp. 211-213, Costa Rica.

*Hesperomys (Vesperimus?) nudipes*, n. sp., J. A. ALLEN, t. c. pp. 213 & 214, *ibid*; = *Vesperimus nudipes*, t. c. p. 297.

*Hesperomys (Vesperimus) affinis*, n. sp., J. A. ALLEN, P. U. S. Nat. Mus. xiv, pp. 195 & 196, Mexico.

*Hesperomys (Vesperimus) melanophrys*, note on by J. A. ALLEN, *t. c.* pp. 194 & 195.

*Hesperomys (Oryzomys) alfuroi*, n. sp., J. A. ALLEN, *t. c.* pp. 214 & 215, Costa Rica.

*Oryzomys aquaticus*, Texas, J. A. ALLEN, p. 289, Bull. Am. Mus. Nat. Hist. iii; *talamanca*, Costa Rica, *id.* p. 193, P. U. S. Nat. Mus. xiv : n. spp.

*Vesperimus difficilis*, Zacatecas, Mexico, p. 298, *nasutus*, Colorado, p. 299, *mearnsi*, Texas, p. 300, J. A. ALLEN, Bull. Am. Mus. Nat. Hist. iii : n. spp.

*Mus maorium* : notes on this and other New Zealand Rats ; J. WHITE, Tr. N. Z. Inst. xxiii, pp. 194-201, pl. xxii.

*Neotoma micropus*, n. var. *canescens*, J. A. ALLEN, Bull. Am. Mus. Nat. Hist. i, pp. 285-287, Beaver River, Indian Territory.

*Neotoma torquata*, n. sp., WARD, Am. Nat. xxv, pp. 160 & 161, Mexico.

*Microtus chinensis*, n. sp., THOMAS, Ann. N. H. (6) viii, pp. 117-119, woodcut, Szechuen.

*Arvicola macropus*, p. 59, *mordax*, p. 61, *nanus*, p. 63, Idaho, MERRIAM, North American Fauna (*suprà*, p. 13), No. 5 : n. spp.

*Evotomys idahoensis*, n. sp., MERRIAM, *t. c.* p. 67, Idaho.

*Erotomys gapperi*, n. var. *brevicaudus*, MERRIAM, *t. c.* p. 119, Dakota.

*Habrothrix hydrobates*, n. sp., WINGE, Vid. Medd. 1891, pp. 1-8, pl. i. An aquatic form with fringes on the feet.

*Phenacomys longicaudus*, n. sp., TRUE, P. U. S. Nat. Mus. xiii, pp. 303 & 304, Oregon.

*Phenacomys orophilus*, n. sp., MERRIAM, N. American Fauna, No. 5, p. 66, Idaho.

#### e. SPALACIDÆ.

*Rhizomys annectans*, n. sp., THOMAS, Ann. N. H. (6) vii, p. 2, & P. Z. S. 1891, pp. 186 & 187, Mianzini, East of Lake Naivasha, E. Africa.

#### f. GEOMYIDÆ.

*Dipodops sennetti*, Texas, p. 226, *richardsoni*, Indian Territory, p. 277, J. A. ALLEN, Bull. Am. Mus. Nat. Hist. iii : n. spp.

*Dipodops ordi*, n. var. *palmeri*, J. A. ALLEN, *t. c.* pp. 276 & 277, San Luis Potosi, Mexico.

*Microdipodops megacephalus*, n. g. & sp., MERRIAM, North American Fauna (*suprà*, p. 13), No. 5, pp. 115-117, Nevada.

*Perognathus (Chrotodipus) femoralis*, n. sp., J. A. ALLEN, Bull. Am. Mus. Nat. Hist. iii, p. 281, San Diego, California.

*Thomomys clusius*, n. var. *fuscus*, MERRIAM, *op. cit.* p. 70, Idaho.

## g. DIPODIDÆ.

*Zapus insignis*, n. sp., MILLER, Am. Nat. xxv, pp. 742 & 743, Nova Scotia.

## h. OCTODONTIDÆ.

ALLEN, J. A. Description of a New Species of *Capromys*, from the Plana Keys, Bahamas. Bull. Am. Mus. Nat. Hist. iii, pp. 329-336, figures.

In addition to the description of the new species, a synopsis of the genus is given.

*Capromys ingrahami*, n. sp., ALLEN, l. c., Bahamas.

LANGKAVEL, B. Die Binsenratte, *Aulacodus*. Zool. Gart. xxxii, pp. 48-52.

*Dactylomys dactylinus*: F. A. JENTINK, Notes Leyd. Mus. xiii, pp. 105-110, pl. vii, shows that this is the proper name for the Rodent usually known as *D. typus*, and describes and figures its skull and dentition.

↓ *K[C]annabateomys amblyonyx*, n. g., JENTINK, l. c.; type *Dactylomys amblyonyx*. Distinguished from *Dactylomys* by its cheek dentition.

↓ *Aconcomys*, n. n., AMEGHINO, Rev. Arg. Hist. Nat. i, p. 245; to replace *Schizodon*, Waterhouse, preoccupied.

† *Potamarchus sigmodon*, n. sp., AMEGHINO, t. c. pp. 140 & 141, Tertiary, Parana.

↓ † *ColpoSTEMMA sinuata*, n. g. & sp., AMEGHINO, t. c. p. 141, *ibid.*

† *Neoreomys limatus*, n. sp., AMEGHINO, t. c. p. 142, Tertiary, Patagonia.

↓ † *Strophostephanos jheringi*, n. g. & sp., AMEGHINO, t. c. pp. 142 & 143, Tertiary, Parana.

† *Stichomys planus*, p. 299, † *gracilis*, † *diminutus*, p. 300, Tertiary, Patagonia, AMEGHINO, t. c. : n. spp.

↓ † *Gyrignophus complicatus*, n. g. & sp., AMEGHINO, t. c., p. 300, *ibid.*

↓ † *Graphimys prorectus*, n. g. & sp., AMEGHINO, t. c., *ibid.*

↓ † *Pseudoneoreomys pachyrhynchus*, n. g. & sp., † *leptorhynchus*, p. 300, † *mesorhynchus*, p. 301, n. spp., *ibid.*, AMEGHINO, t. c.

↓ † *Lomomys exezus*, n. g. & sp., AMEGHINO, t. c. p. 301, *ibid.*

† *Perimys scalaris*, † *angulatus*, n. spp., AMEGHINO, l. c. *ibid.*

## i. HYSTRICIDÆ.

*Hystrix hirsutirostris*: NEHRING, S.B. nat. Fr. 1891, pp. 185-189, describes and figures the ulna of a Porcupine from the Pleistocene of Bavarian Franconia, which he provisionally refers to this species.

† *Acuremys karaikensis*, n. sp., AMEGHINO, Rev. Arg. Hist. Nat. i, p. 299, Tertiary, Patagonia.

## k. CHINCHILLIDÆ.

†*Tetrastylus montanus*, n. sp., F. AMEGHINO, Rev. Arg. Hist. Nat. i, pp. 94 & 95, Tertiary, Argentina.

†*Sphiggomys* [*Sphingomys*, R. L.] *pueraster*, †*puellus*, n. spp., Tertiary, Patagonia, AMEGHINO, t. c. p. 143.

†*Perimys perpinguis*, †*planaris*, n. spp., *ibid.*, AMEGHINO, t. c. p. 144.

†*Lagostomus egenus*, p. 145, Tertiary, La Plata, †*striatus*, †*laminosus*, p. 245, Tertiary, Parana, n. spp., AMEGHINO, t. c.

†*Gyrabrius glutinatus*, n. g. & sp., AMEGHINO, t. c. p. 246, Tertiary, Parana.

## l. †EOCARDIIDÆ.

†*Eocardia elliptica*, p. 145, †*fissa*, p. 146, AMEGHINO, Rev. Arg. Hist. Nat. i, Tertiary, Patagonia : n. spp.

†*Phanomys vetulus*, n. sp., AMEGHINO, l. c. *ibid.*

†*Procardia*, n. subg., AMEGHINO, t. c. p. 302 ; type, *Eocardia elliptica*, Amegh.

†*Dicardia maxima*, n. subg. & sp., †*modica*, †*excavata*, n. spp., AMEGHINO, l. c., Tertiary, Patagonia.

†*Tricardia*, n. subg., p. 302 ; type, *Eocardia divisa*, Amegh. ; †*gracilis*, †*crassidens*, p. 303, n. spp., Tertiary, Patagonia ; AMEGHINO, t. c.

†*Schistomys crassus*, n. g. & sp., AMEGHINO, t. c., p. 303, *ibid.*

## m. CASTOROIDIDÆ.

MOORE, J. Description of a New Species of Gigantic Beaver-like Rodent. J. Cincinn. Soc. xiii, pp. 26–30, pls. v & vi (1890).

— . Concerning a Skeleton of the Great Fossil Beaver, *Castoroides ohioensis*. T. c. pp. 138–169, figs. (1890).

The first paper describes an incisor from Georgia, regarded as indicating a new species of *Castoroides*, but subsequently, t. c. p. 103, referred to a recent Hippopotamus. The second paper describes, with figures, a nearly entire skeleton of *Castoroides*, obtained from Indiana, in 1889.

†*Castoroides georgiensis*, n. sp., MOORE, t. c. p. 30 ; subsequently withdrawn.

†*Loxomylus angustidens*, n. sp., BURMEISTER, An. Mus. B. Aires, iii, pp. 384–387, pl. vii, fig. 3, Tertiary, Argentina.

## n. CAVIIDÆ.

BEDDARD, F. E. Notes on the Anatomy of *Dolichotis patagonica*. P. Z. S. 1891, pp. 236–244, woodcuts.

It is considered that the genus is allied to the *Dasyproctidæ* rather than to the *Hystriidæ*.

1891. [VOL. XXVIII.]

NEHRING, A. Ueber die Fortpflanzung und Abstammung des Meerschweinchens (*Cavia cobaya*, Marcgr.). Zool. Gart. xxxii, pp. 65-77.

†*Ortomyctera improba*, n. sp., AMEGHINO, Rev. Arg. Hist. Nat. i, pp. 146 & 147, *ibid*.

‡†*Eucardiodon*, n. n., AMEGHINO, *t. c.* p. 247; to replace *Cardiodon*, Ameg., preoccupied. †*E. affinis*, n. sp., AMEGHINO, *l. c.*, Tertiary, Parana.

#### O. LEPORIDÆ.

BURNE, R. H. On the Variation and Development of the Leporine Sternum. P. Z. S. 1891, pp. 159-164, fig.

After referring to the costal origin of the Mammalian sternum, the author enters into a detailed examination of that of the *Leporidae*. It is concluded that it originally consisted of eight sternobræ, but that the place of the seventh has been usurped by the ribs, which became detached and grew forward over the ventral surface.

*Lepus insularis*, n. sp., BRYANT, P. Ac. Calif. iii, p. 92, California.

*Lepus idahoensis*, n. sp., MERRIAM, North American Fauna, No. 5 (*suprà*, p. 13), p. 76, Idaho.

### 6. UNGULATA.

#### A.—†TILLODONTIA.

##### a. †ECTOGANIDÆ.

‡†*Entocasmus heterogenidens*, n. g. & sp., AMEGHINO, Rev. Arg. Hist. Nat. i, p. 139, Tertiary, Patagonia.

#### B.—†TOXODONTIA.

##### b. †PROTYPOTHERIIDÆ (INTERATHERIIDÆ).

F. AMEGHINO, Rev. Arg. Hist. Nat. i, pp. 393-397, figs., gives the chief characters of this family, showing that the teeth formed a continuous series, the terminal phalanges of the digits were expanded for a flattened nail, and the hallux and pollex were opposable. While allied to the *Typotheriidæ*, it is considered that it is also related to the Primates (*suprà*, p. 22).

†*Protypotherium globosum*, p. 291, †*converidens*, †*diversidens*, †*compressidens*, p. 292, Low. Tertiary (Eocene), Patagonia, AMEGHINO, Rev. Arg. Hist. Nat. i : n. spp.

†*Patriarchus furculosus*, p. 292, †*distortus*, †*rectus*, †*diastematus*, †*leptcephalus*, †*taltus*, p. 293, Low. Tertiary, Patagonia, AMEGHINO, Rev. Arg. Hist. Nat. i : n. spp.



## c. †TYPOTHERIIDÆ.

AMEGHINO, F. Observaciones sobre algunas Especies de los Géneros *†Typotherium* y *Entelomorphus*. Rev. Arg. Hist. Nat. i, pp. 433-437.

Mainly deals with the question of the number of species; but also shows that *Typotherium* ranges from the Pleistocene Pampean beds to the Mid. Tertiaries (Miocene) of Monte Hermosa and Catamarca.

MERCERAT, A. Apuntes sobre el Género *Typotherium*. Rev. Mus. la Plata, ii, pp. 74 *et seq.*

Criticizes Ameghino's species of this genus.

†*Typotherium studei*, n. sp., MORENO & MERCERAT, Rev. Mus. la Plata, i, p. 228, Mid. Tertiary, Catamarca.

†*Typotherium internum*, n. sp., AMEGHINO, Rev. Arg. Hist. Nat. i, p. 93, *ibid.*

*Hegetotherium convexum*, p. 133, †*anceps*, †*cuneatum*, †*costatum*, p. 242, Low. Tertiary, Patagonia, AMEGHINO, Rev. Arg. Hist. Nat. i : n. spp.

†*Xotodon cristatus*, n. sp., MORENO & MERCERAT, *t. c.*, p. 228, Mid. Tertiary, Catamarca.

†*Palæolithops*, n. n., to replace *Lithops*, 1887, preoccupied; AMEGHINO, Rev. Arg. Hist. Nat. i, p. 240.

††*Tremacyllus*, n. g., AMEGHINO, *t. c.* p. 241; type, *Pachyrucus impressus*, Amegh.

## d. †TOXODONTIDÆ.

†MERCERAT, A. Sinopsis de la Familia de los *Protoxodontidæ*. La Plata : 1891, 8vo, 68 pp.

Includes a large number of so-called new forms, most of which are identified in the following paper by Ameghino with those previously described.

AMEGHINO, F. *Nesodontidæ*. Rev. Arg. Hist. Nat. i, pp. 354-379, figs.

After noticing the above memoir by Mercerat, the author makes some very important additions to our knowledge of *Nesodon*. It is shown that there is an enormous difference between the milk and permanent dentition, which has been the source of many errors. In the first place it is shown that Owen's *N. sullivan* is merely the adult of *N. imbricatus*; and that his *N. ovinus* belongs to *Adinotherium*. The genera *Colpodon*, *Protoxodon*, *Adelphotherium*, *Atrypottherium*, and *Scopotherium* are then severally identified with *Nesodon*, their type species mostly belonging to *N. imbricatus*. The paper concludes with a synopsis of the species of *Nesodon* and the allied genera, among which several are recorded as new. For a full monograph of *Nesodon*, see the memoir by Burmeister quoted on page 5, in which figures of the skull are given, and several of Ameghino's genera are identified with *Nesodon*.

†*Toxodon paranensis* and *T. parvus*, see BURMEISTER, *suprà*, p. 5.

†*Adinotherium haplodontoides*, Tertiary, Patagonia, p. 129, †(?) *paranense*, Tertiary, Parana, p. 130, †*robustum*, Tertiary, Patagonia, p. 377, AMEGHINO, *Rev. Arg. Hist. Nat.* i : n. spp.

†*Anotherium karaikense*, p. 131, †*stygium*, p. 133, *ibid.*, AMEGHINO, *Rev. Arg. Hist. Nat.* i : n. spp.

↓ †*Pachynodon* (with ? n. spp. *validus* and *modicus*), n. n., BURMEISTER, *An. Mus. B. Aires*, iii, pp. 433-440, = *Trigodon* and *Haplodontherium*.

↓ †*Eutrigonodon*, n. n., AMEGHINO, *Rev. Arg. Hist. Nat.* i, p. 240, to replace *Trigodon* (1882), preoccupied.

↓ †*Xotoprodon solidus*, n. g. & sp., p. 241, and †*maximus*, n. sp., Tertiary, Patagonia, p. 375, AMEGHINO, *t. c.*

†*Nesodon andium*, n. sp., AMEGHINO, *t. c.* p. 377, *ibid.*

↓ †*Notohippus toxodontoides*, n. g. & sp., AMEGHINO, *t. c.* p. 135, *ibid.* Identified by BURMEISTER, *An. Mus. B. Aires*, iii, p. 411, with *Nesodon ovinus*.

↓ †*Nannodus eocænus*, n. g. & sp., AMEGHINO, *Rev. Arg. Hist. Nat.* i, p. 241, Tertiary, Patagonia.

†*Trachytherus conturbatus*, n. sp., AMEGHINO, *l. c.*, *ibid.*

## C.—PROBOSCIDEA.

### e. ELEPHANTIDÆ.

CANTAMESSA, F. Il Mastodonte di Cinaglio d'Asti, ed il *Mastodon arvernensis* (Cro. & Job). *Mem. Acc. Tor.* (2) xli, pp. 339-379, pls. i & ii.

Describes and figures a mandible of *Mastodon arvernensis* from the Pliocene of Cinaglio d'Asti.

GALIPPE, V. Recherches d'Anatomie Normale et Pathologique sur l'Appareil Dentaire de l'Elephant. *J. de l'Anat. Phys.* xxvii, pp. 285-343, figs.

After describing the mode of attachment of the teeth of elephants to the gum, proceeds to illustrate a number of cases of disease in these organs.

GAUDRY, A. Le Mastodonte du Cheirichira. *C.R.* cxii, pp. 1297 & 1298.

A preliminary note on the specimens described in the following memoir.

—. Quelques Remarques sur les Mastodontes à propos l'Animal du Cheirichira. *Mém. Soc. Géol. Pal.*, No. 8, 6 pp., pls. i & ii.

Describes *Mastodon* teeth from Tunis, obtained from Lower Miocene age. They are referred to *Mastodon angustidens* and *M. turicensis*.

NAUMANN, E. *Stegodon mindanensis* eine neue Art von Uebergangsmastodonten. *Z. geol. Ges.* xlii, pp. 166, *et seq.*

SIRODOT, —. Les Elephants du Mont Dol (Ille-et-Vilaine). C.R. cxii, pp. 373–375.

Records teeth of *Elephas primigenius* and *E. antiquus* from these deposits.

†*Elephas primigenius*, n. var. *hydruntinus*, U. BOTTI, Bol. Soc. Geol. Ital. ix, p. 709, Pleistocene, Otranto, Italy.

†*Mastodon maderianus*, n. sp., F. AMEGHINO, Rev. Arg. Hist. Nat. i, p. 243, Tertiary, Argentina.

†*Mastodon arvernensis*, recorded by F. TELLER, Verh. geol. Reichsanst., 1891, pp. 295–297, from S. Styria.

#### D.—HYRACOIDEA.

##### f. HYRACIDÆ (PROCAVIIDÆ).

*Procavia pallida*, n. sp., O. THOMAS, Ann. Mus. Genov. (2) x, p. 908, N. Somaliland.

#### E.—†CONDYLARTHRA.

##### g. †MENISCOTHERIIDÆ.

†*Hyracodontotherium*, referred by M. SCHLOSSER, Arch. f. Anthrop. xx, p. 126, to *Diplobune* (*Anoplotheriidae*).

#### F.—PERISSODACTYLA.

LYDEKKER, R. Prof. Osborn on the Molars of the *Perissodactyla*. Geol. Mag. (3) viii, pp. 317–321, and woodcuts.

Explains the terms proposed by Osborn for the lophodont type of molar, with some corrections.

##### h. †MACRAUCHENIIDÆ.

COPE, E. D. The *Litopterna*. Am. Nat. xxy, pp. 687–693, pl. xvii, & cuts.

Discusses the structure of the members of this and the next two families, all of which are placed in the suborder *Litopterna*, of the order 'Taxeopoda.' The *Macraucheniidae* and *Protherotheriidae* are characterized by having upper molars of a Palæotherioid type, with V.s., while those of the *Astrapotheriidae* (*Homalodontotheriidae*) are rhinocerotid, with straight outer walls. The structure of the carpus and tarsus is described as Taxeopodous; and the various genera of the three families are defined. A curious parallelism between the members of this group and the *Equidae* and *Rhinocerotidae* is noticed.

MERCERAT, A. Caracteres Diagnosticos de Algunas Especies del Genus *Theosodon*. Rev. Mus. la Plata, ii, pp. 37–49.

Distinctive characters of the representatives of this genus preserved in the Museum at La Plata. Five new species are named (*vide infra*).

† *Macrauchenia lydekkeri*, n. sp., MORENO & MERCERAT, *Rev. Mus. la Plata*, i, p. 229, Mid. Tertiary, Catamarca. Identified with *M. antiqua*, Amegh., in *Rev. Arg. Hist. Nat.* i, p. 204.

† *Macrauchenia calceolata*, n. sp., MORENO & MERCERAT, *op. cit.* p. 230, *ibid.*

† *Scalabrinitherium denticulatum*, n. sp., F. AMEGHINO, *Rev. Arg. Hist. Nat.* i, p. 136, Tertiary, Parana.

† *Celosoma eversa*, n. g. & sp., AMEGHINO, *t. c.* p. 137, *ibid.*

† *Pseudocelosoma patagonica*, n. g. & sp., AMEGHINO, *t. c.* p. 294, Tertiary, Patagonia.

† *Theosodon fontanae*, p. 294, † *gracilis*, p. 295, *ibid.*, AMEGHINO, *t. c.*; † *lallemani*, † *frenzei*, † *patagoniensis*, † *gracilis*, † *debilis*, Tertiary, Patagonia, MERCERAT, *Rev. Mus. la Plata*, i, pp. 48 & 49: n. spp.

In *Rev. Arg. Hist. Nat.* i, p. 353, AMEGHINO identifies the first two of Moreno's species with his own *T. lydekkeri*, and the three latter with his *T. gracilis* (non MERCERAT).

#### i. † PROTEROTHERIIDÆ.

\*MERCERAT, A. Sinopsis de la Familia de los *Bunodontheridæ*, conservados en el Museo de la Plata. La Plata: 1891, 8vo, 26 pp.

Describes a number of Mammalian remains from the Tertiary of Patagonia, which are referred to a new family, and many of which are considered to indicate new genera and species. The forms described as new include the genus *Bunodontherium*, with the species *B. patagonicum*, *B. majusculum*; the species *Thoatherium minusculum* and *periculosum*; the genus and species *Anomodontherium montanum*; the genus *Antisolophus*, with the species *australis*, *burmeisteri*, and *fischeri*; the genus *Oreomeryx* (preoccupied), with the species *propius*, *superbus*, and *ruetimeyeri*; *Merycodon* (preoccupied), with *M. damesi* and *M. rusticus*; and the genus and species *Rhagodon gracilor*. The memoir is criticized by AMEGHINO in *Rev. Arg. Hist. Nat.* i, pp. 338-346, with illustrations. It is there stated that the family *Bunodontheridæ* is the same as *Proterotheriidæ*, and that most of the genera and species have been previously described. *Bunodontherium* is identified with *Diadiaphorus*; *Anomodontherium* with *Thoatherium*; and *Oreomeryx*, *Merycodon*, and *Rhagodon* with *Proterotherium*. A synopsis, with figures, is given of the family.

† *Proterotherium gradatum*, Tertiary, Parana, p. 137, † *curtidens*, † *cingulatum*, Tertiary, Patagonia, p. 296, AMEGHINO, *Rev. Arg. Hist. Nat.* i: n. spp.

† *Licaphrium intermedium*, Mid. Tertiary, Catamarca, MORENO & MERCERAT, *Rev. Mus. la Plata*, i, p. 230; † *parvulum*, † *intermedium*, Tertiary, Patagonia, AMEGHINO, p. 297, *Rev. Arg. Hist. Nat.* i: n. spp.

† *Thoatherium crepidatum*, n. sp., AMEGHINO, *l. c.*, *ibid.*

† *Diadiaphorus diplinthius*, n. sp., AMEGHINO, *t. c.* p. 298, *ibid.*

k. †HOMALODONTOTHERIIDÆ (ASTRAPOTHERIIDÆ).

See above, under *Macraucheniidæ*, for Cope's notes on this family.

MERCERAT, A. Sinopsis de la Familia de los *Astrapotheriidæ* (Eoceno de Patagonia). Rev. Mus. la Plata, i, pp. 237-257.

A large number of species of this group from the Tertiary of Patagonia are described. The dental formula of the genus *Astrapotherium* (of which the first known specimen was *Nesodon magnus*, Owen) is given as  $i. \frac{3}{1}, c. \frac{1}{1}, p. \frac{2}{1}, m. \frac{3}{1}$ . The new forms are mentioned below.

In Rev. Arg. Hist. Nat. i, pp. 332-338, AMEGHINO criticizes the above paper, and concludes that *Listriotherium* and *Xylotherium* are founded upon young individuals of *Astrapotherium*, while none of the new species of the latter will stand. The recognized species of *Astrapotherium* are *A. magnum*, *giganteum*, *nanum*, *columnatum*, and *delimitatum*.

†*Homalodontotherium segoviæ*, n. sp., AMEGHINO, Rev. Arg. Hist. Nat. i, p. 295, Tertiary, Patagonia.

†*Diorotherium egregium*, n. g. & sp., AMEGHINO, t. c. p. 296, *ibid*.

†*Astrapotherium angustidens*, p. 246, †*voghtii*, p. 248, †*burmeisteri*, p. 249, †*marshi*, p. 250, †*gaudryi*, †*robustum*, p. 251, Tertiary, Patagonia, MERCERAT, Rev. Mus. la Plata, i; †*A. columnatum*, †*delimitatum*, †*nanum*, †*giganteum*, Tertiary, Patagonia, AMEGHINO, p. 298, Rev. Arg. Hist. Nat. i : n. spp.

†*Astrapodon carinatus*, n. g. & sp., AMEGHINO, t. c. p. 299, *ibid*.

†*Listriotherium patagonicum*, n. g. & sp., p. 252, †*filholi*, n. sp., p. 253, MERCERAT, Rev. Mus. la Plata, i, Tertiary, Patagonia.

†*Xylotherium mirabile*, n. sp., MERCERAT, t. c. p. 254, *ibid*.

Of Uncertain Family.

†*Adiantus buccatus*, n. g. & sp., AMEGHINO, Rev. Arg. Hist. Nat. i, pp. 134 & 135, Tertiary, Patagonia.

l. †LOPHIODONTIDÆ.

*Lophiodon isselensis*; remains provisionally assigned to this species recorded by C. J. FORSYTH-MAJOR, P.-v. Soc. Tosc. vii, p. 209, from the Eocene of Monteponi, Italy.

m. EQUIDÆ.

AMEGHINO, F. Observaciones Criticas sobre los Caballos Fósiles de la República Argentina. Rev. Arg. Hist. Nat. i, pp. 4-17 & 65-88, figures.

A review of the fossil Horses of Argentina, with figures of teeth. The species are arranged under the genera *Hippidion*, *Hipp[o]haplus*, and *Equus*. Three species of the latter are recognized, viz., *E. argentinus*, *E. curvidens*, and *E. rectidens*.

BONNET, R. Die Eihäute des Pferdes. Anat. Anz.—Verh. Anat. Ges. 3<sup>ter</sup> Versamml, 1889, pp. 17–38, figs. (1889).

A memoir on the foetal membranes of the Horse.

BURMEISTER, H., An. Mus. B. Aires, iii, pp. 468 & 469, has supplemental notes on the fossil *Equidæ* of Argentina.

FLOWER, W. H. The Horse : a Study in Natural History (Modern Science Series). London : 1891, 12mo, 196 pp., illustrated.

A semipopular account of the Horse, its position in the animal kingdom, and its nearest living and extinct relations.

PAVLOW, (MADAME) M. Notice sur l'*Hipparion crassum* du Roussillon. Bull. Mosc. 1891, pp. 161–164; and Qu'est-ce Que C'est Que L'*Hipparion*, t. c. pp. 410–414.

In the first paper the author points out that some of the specimens referred to the species named really belong to *Equus*, and also alludes to her own views that *Hipparion* is not a direct ancestor of *Equus*. The latter subject forms the basis of the second paper.

† *Onohippus muñizi*, n. g. & sp., F. P. MORENO, Rev. Mus. la Plata, ii, p. 65, Tertiary, Argentina. Identified by H. BURMEISTER, An. Mus. B. Aires, iii, p. 470, with *Hippidium*.

#### n. †PALÆOTHERIIDÆ.

For *Mesohippus*, see SCOTT, *suprà*, p. 16.

#### o. RHINOCEROTIDÆ.

*Rhinoceros bicornis* : F. E. BEDDARD & J. MURIE, P. Z. S. 1891, pp. 246 & 247, have notes on the cause of death of a specimen in the Zoological Society's Gardens, which had lived there since 1868.

*Rhinoceros sumatrensis* : E. BARTLETT, t. c. pp. 654 & 655 has observations on Bornean specimens, with figure of the horns.

#### p. †LAMBDOOTHERIIDÆ.

EARLE, C. Preliminary Observations upon *Palæosyops* and Allied Genera. P. Ac. Philad. 1891, pp. 106–117, woodcuts.

It is proposed to divide the group as follows, viz :—

I. Last upper molar with one inner column.

A. Outer columns of upper premolars separated.—*Palæosyops*.

B. Outer columns of upper premolars straight.—*Telmatotherium*.

II. Last upper molar with two inner columns.—*Limnokyops*.

One new species of *Palæosyops* described.

† *Palæosyops minor*, EARLE, P. Ac. Philad. 1891, pp. 112 & 113 ;  
† *megarhinus*, EARLE, Am. Nat. xxv, pp. 45–47, fig. : Mid. Eocene, Wyoming : n. spp.

## q. †TITANOTHERIIDÆ.

†*Menodus angustigenis*; *Haplacodon* [Zool. Rec. xxvi, *Mamm.* p. 40] is identified by E. D. COPE, Contr. Canad. Pal. iii (*suprà*, p. 6), p. 13, with *Menodus* (*Titanotherium*), with description of the specimens.

†*Menodus selwynianus*, n. sp., COPE, Am. Nat. xxiii, p. 628 (1890), Miocene, Canada; described, *op. cit.* p. 17.

†*Menodus syceras*, n. sp., COPE, Am. Nat. xxiii, p. 628 (1890), *ibid*; described, Contr. Canad. Pal. iii, p. 18.

†*Allops crassicornis*, n. sp., O. C. MARSH, Am. J. Sci. (3) xlii, pp. 268 & 269, Miocene, Dakota.

†*Brontops vallidus*, n. sp., MARSH, *t. c.* p. 269, *ibid*.

†*Titanops medius*, n. sp., MARSH, *l. c.*, *ibid*.

## G.—ARTIODACTYLA.

PIANA, G. P. Dei Denti Incisivi e Canini Superiore nei Bovina e negli Ovini e dell'Organo di Jacobson nell' Uomo. Monit. Zool. Ital. ii, pp. 44-47.

Further observations on the presence of germs of cutting-teeth in the upper jaws of Oxen and Sheep, together with a notice of the presence of Jacobson's organ in Man.

THOMAS, O. Notes on some Ungulate Mammals. P. Z. S. 1891, pp. 384-389.

This paper deals exclusively with selenodont Artiodactyles. The first section is devoted to the *Tragulidæ*, where *Tragulus kanchil* is identified with *T. javanicus*, and a synopsis of the genus given; the name *Dorcatherium* is adopted in place of *Hyomoschus*. The second section deals with the Llamas and Alpacas, for which the name *Lama* is adopted; and it is considered that both the Llama and the Alpaca are derived from the Huanaco. The third section gives a synopsis of the range and number of the species of *Tragelaphus*, in which it is concluded that *T. decula* and *T. sylvaticus* are varieties of *T. scriptus*. *Oreotragus* is regarded as distinct from *Nanotragus*.

ZANDER, R. Schlundkopfes des Wiederkäuer. SB. Ges. Königsb. 1890, p. 6.

Contrasts the structure of the nasal region of the skull of the Ruminants with that of other Mammals.

## r. BOVIDÆ.

HUET, J. Les Bovidés. Bull. Soc. Acclim. 1891, i, pp. 1-15 & 334-350, figs.

A synopsis of the various species of Oxen.

[HUET, J.] Liste des Espèces Connues et Decrites jusqu'a ce jour dans les Familles des Ovidés et Capridés. Bull. Soc. Acclim. 1891, ii, pp. 241-255, 369-380, 470-478, & 561-570, figs.

An account of the Sheep and Goats, and also of the *Camelidæ*.

LANGKAVEL, B. Der Europäische Muflon, das Mähnenschaf und der Cyprische Muflon. Zool. Gart. xxxii, pp. 180-185.

Describes the former range of *Ovis musimon*, with a discussion of its relationship to domestic Sheep, and concludes with a notice of the Cyprian wild sheep.

LYDEKKER, R. African Antelopes. Field, lxxvii, pp. 857, 858, 873, 874, & 980, and lxxviii, pp. 45, 46, 130, & 204, figs.

An illustrated popular account of all the known species.

MORRIS, A. W. On Abnormal Horns of the Indian Antelope, with some Remarks on their probable Causes. J. Bomb. N. H. Soc. vi, pp. 184-188, pl.

THOMAS, O. On some Antelopes collected in Somaliland by Mr. T. W. H. Clarke. P. Z. S. 1891, pp. 206-212, pls. xxi & xxii.

Adopts the name *Lithocranius* for *Gazella walleri*; describes the new *Ammodorcas clarkei*; shows that *Gazella naso* is identical with *G. spekei*; and identifies the Gazelle referred by Lort Phillips to the latter with *G. pelzelni*, Kohl. [Vide infra.]

*Bos bubalus*, n. var. *fulvus*, W. T. BLANFORD, Mammalia of India (suprà, p. 5), p. 492.

† *Bubalus baini*, n. sp., H. G. SEELEY, Geol. Mag. (3) viii, pp. 199-202, woodcut, Pleistocene, S. Africa.

† *Anoa santeng*, n. sp., F. A. JENTINK (ex Dubois, MS.), Notes Leyd. Mus. xiii, p. 220, pre-historic (? also living), Java.

† *Ovis argaloides*, n. sp., A. NEHRING, JB. Mineral. 1891, ii, p. 116, pl. iii, figs. 1-3, Pleistocene, Moravia.

† *Ovis antiqua* and *Caprovis savigni*, notes on, by NEHRING, t. c. pp. 149-151.

*Capra (Ibex)*, sp., recorded by NEHRING, t. c. p. 133, pl. iii, fig. 4, from Moravian Pleistocene.

† *Saiga prisca*, n. sp., NEHRING, op. cit. ii, p. 131, woodcut, Pleistocene, Moravia. The same author, SB. nat. Fr. 1891, pp. 173-175, has notes on *Saiga* remains from Bourg, in the Gironde.

*Ammodorcas clarkei*, n. g. & sp., O. THOMAS, Ann. N. H. (6) vii, p. 2 (as *Cervicapra*), and P. Z. S. 1891, p. 207, pls. xxi & xxii, N. Somaliland. See also P. L. SCLATER, P. Z. S. 1891, p. 197.

*Gazella walleri*, "C. D. L.," Field, lxxviii, p. 326, has notes on its habits.

*Strepsiceros kudu*: a specimen with horns measuring  $45\frac{1}{2}$  inches in a straight line recorded in P. Z. S. 1891, p. 145.

*Tragelaphus* (?): notes on horns and skin of an Antelope from the



Aruwimi forest, probably referable to the Tragelaphine section, are given by P. L. SCLATER, P. Z. S. 1891, pp. 1-3, woodcuts.

<sup>4</sup>*Doratoceros*, n. g., R. LYDEKKER, Ann. N. H. (6) viii, p. 192, and Field, lxxviii, p. 130: type, *Antilope triangularis*, Günther.

*Rupicapra tragus*: remains described by A. NEHRING, JB. Mineral. 1891, ii, p. 138, from the Pleistocene of Moravia.

#### s. ANTILOCAPRIDÆ.

MARSHALL, W., & POHLIG, H. Die Amerikanische Gabel-antilope. Zool. Gart. xxxii, pp. 97-108 & 161-171, woodcut.

A description of the Pronghorn, with a discussion of its affinities. POHLIG proposes for its reception a special group—*Antilocervidæ*—to include *Sivatherium*, &c., as well as certain other Tertiary Ruminants.

#### t. GIRAFFIDÆ.

BRYDEN, H. A. On the present Distribution of the Giraffe, South of the Zambesi. P. Z. S. 1891, pp. 445-447.

LYDEKKER, R. The Giraffe and its Allies. Nature, xliv, pp. 524-526.

Reasons are given for considering the points in which the skulls of *Sivatherium* and *Hydasitherium* resemble *Alcelaphus* as acquired ones.

MAJOR, C. J. FORSYTH. On the Fossil Remains of Species of the Family *Giraffidæ*. P. Z. S. 1891, pp. 315-326, figs.

It is shown that *Camelopardalis biturigum* is founded on a lower jaw of *Giraffa camelopardalis*. The characters of *Samotherium* are fully detailed, and it is shown that *Alcicephalus* is the female of that genus. Evidence of the close affinity of *Palæotrachus* to *Samotherium* is adduced. Next we have a discussion of the affinities of *Sivatherium* and *Hydasitherium*, in which it is concluded that they are undoubted Giraffoids. The paper ends with a description of the skull of *Helladotherium*, where reasons are given for considering that the hornless skull from the Siwaliks referred to that genus probably belongs to the female of a form allied to *Hydasitherium*.

*Alcicephalus*, Rodl. & Weith. [Zool. Rec. xxvii, Mamm. p. 45] identified by MAJOR, *op. cit.* p. 319, with *Samotherium*.

#### u. CERVIDÆ.

LOCKHART, J. G. Notes on the Habits of the Moose in the Far North of British America in 1865. P. U. S. Nat. Mus. xiii, pp. 305-308. Reprinted in Zool. (3) xv, pp. 206-210.

LYDEKKER, R. The Deer of South America. Field, lxxvii, pp. 630 & 631, figs.

A popular account of the various species.

NITSCHÉ, H. Studien über das Elchwild, *Cervus alces*, Linn. Zool. Anz. xiv, pp. 181-191.

Notes on the dentition, development of the antlers, and skeleton of the Elk.

SHUFELDT, R. W. On the External Characters of Foetal Reindeer, and Other Notes. P. Ac. Philad. 1891, pp. 224-233, figs.

† *Cervus megaceros*, n. var. *ruffi*, A. NEHRING, SB. nat. Fr. 1891, pp. 151-162, Pleistocene, Kottbus.

↓ *Ozotoceros*, n. g., F. AMEGHINO, Rev. Arg. Hist. Nat. i, p. 243 ; to replace *Blastoceros*, Gray, preoccupied.

#### INCERTÆ SEDIS.

MARSH, O. C. A Horned Artiodactyle (*Protoceras celer*) from the Miocene. Am. J. Sci. (3) xli, pp. 81 & 82.

↓† *Protoceras celer*, n. g. & sp., MARSH, l. c., Miocene, Dakota.

#### v. TRAGULIDÆ.

For *Leptomeryx*, see SCOTT, *suprà*, p. 16, and for recent forms, THOMAS, *suprà*, p. 41.

#### w. CAMELIDÆ.

BURMEISTER, H. Studien zur Beurtheilung der Descendenzlehre. Arch. Anat. Phys., Abth. f. Phys. 1891, pp. 1-18.

Deals with the recent and fossil species of *Auchenia*. It is shown that there are three S. American Pleistocene species ; viz., *A. weddelli*, Gerv., allied to the Guanaco, but as large as a Horse ; *A. intermedia*, Gerv., of the size of the Guanaco, and showing variations resembling the existing Llama and Alpaca ; and a new species, *A. minuta*, allied to the Vicugna. *Protauchenia reissi*, Branco, is identified with *A. weddelli* ; and *A. castelnaudi*, Gerv., with *A. intermedia*. In an appendix the specimens described by Ameghino as *Eulamops parallelus*, *Auchenia lama*, *Mesolama angustimaxilla*, *Stilauchenia oweni*, *Auchenia frontosa*, and *Palæolama leptognatha* (see Zool. Rec. xxvi, *Mamm.* p. 44) are identified with *A. weddelli* ; while *A. gracilis*, *A. lujanensis*, and *A. (Palæolama) mesolithica* (Zool. Rec. l. c.) are referred to *A. intermedia (castelnaudi)*.

↓† *Auchenia minuta*, n. sp., H. BURMEISTER, l. c., Pleistocene, S. America. *Neoauchenia*, n. n., F. AMEGHINO, Rev. Arg. Hist. Nat. i, p. 242 ; to replace *Auchenia*, Ill., preoccupied. [*Lama*, Cuv., stands.—R. L.]

† *Hemiauchenia pristina*, n. sp., AMEGHINO, l. c. pp. 138 & 139, Tertiary, Buenos Ayres.

## x. †POEBROTHERIIDÆ.

SCOTT, W. B. On the Osteology of *Poebrotherium*: a contribution to the Phylogeny of the *Tylopoda*. J. Morph. v, pp. 1-78, pls. i-iii.

After discussing certain problems in evolution; the author describes a complete skeleton of *Poebrotherium wilsoni*, and then proceeds to the consideration of the phylogeny of the *Tylopoda*. It is considered that *Procamelus* may have given rise to Llamas and Camels, but that *Homocamelus* is off the direct line, although it may have been the parent of *Holomeniscus* and *Eschatus*. The series is traced down through *Homacodon* (? = *Dichobunus*) to the tritubercular *Pantolestes*. Rutimeyer's view that the *Tylopoda* have acquired their selenodontism independently of the *Pecora* is supported.

## y. †ANOPLOTHERIIDÆ.

For identification of the supposed Condylarthrous genus *Hyracodontotherium* with *Diplobune*, see SCHLOSSER, *suprà*, p. 37.

## z. †ANTHRACOTHERIIDÆ.

FILHOL, H. Observations relatives à la Tubérosité qu'on observe sur certains Maxillaires d'*Anthracotherium magnum*. Ann. Sci. Nat. xii, p. 39.

— Observations concernant la Structure de la Tête de l'*Anthracotherium minimum*. T. c. p. 64.

— De la Dentition Supérieure de l'*Anthracotherium minimum*. Bull. Soc. Philom. (8) iii, pp. 89-91, figs.

— Note concernant l'Étude d'une Tête d'*Anthracotherium minimum* (Cuv.) T. c. pp. 162 & 163, pl. v.

In the first note it is concluded that the presence or absence of a tubercle on the mandibles of *A. magnum* may denote sexual differences. The other notes describe a fine skull of *A. minimum*, which is said to approximate to that of *Hyopotamus*.

SQUINABOL, S. Cenni Preliminari sopra un Cranio ed altre Ossa di *Anthracotherium magnum*, Cuv., di Cadibona. Atti Soc. Lig. Sci. Nat. & Geogr. i, pt. i, 1890. [Omitted from Zool. Rec. xxvii.]

— Rivista dei Grossi *Anthracotherium* di Cadibona. Boll. Soc. geol. Ital. ix, pp. 516-571, pls. xvi-xxi.

Describes and figures a number of remains of *Anthracotherium* from the Italian Tertiary, which are referred to four new species.

†*Anthracotherium gualdii*, †*kowalevskyi*, †*ligusticum*, †*zigno*, Miocene, Cadibona, SQUINABOL, Boll. Soc. geol. Ital. ix, p. 566 : n. spp.

## aa. †CHÆROPOTAMIDÆ.

†*Elotherium arctatum*, n. sp., E. D. COPE, Am. Nat. xxiii, p. 629 (1890), White River Miocene, Canada. Described by COPE, Contr. Canad. Pal. iii (*suprà*, p. 6), p. 20.

## bb. SUIDÆ.

JENTINK, F. A. On the Malayan and Papuan Pigs in the Leyden Museum. Notes Leyd. Mus. xiii, pp. 85-104.

These notes refer to *Sus vittatus*, *S. verrucosus*, *S. barbatus*, *S. timoriensis*, *S. celebensis*, *S. papuensis*, and *S. niger*, of which the museum contains several of the types. It is suggested that *S. longirostris*, Nehring, is founded upon old skulls of *S. barbatus*. It is considered that *S. niger* is the same as *S. ceramensis*, although the former name is provisionally adopted.

KEIFEL, F. Ueber die Entwicklungsgeschichte des Schweines. Anat. Anz. vi, pp. 193-198, figs.

A notice of the earliest stages of the development of the Pig. The observations recorded serve to confirm the view that the entoblast of Mammals is not homologous with that of the lower vertebrates.

NEHRING, A. Die Rassen des Schweines. In Rohde's Schweinezucht, Berlin : 1891, 8vo, 38 pp., 2 pls.

The author classifies the existing Swine as follows;—

## I. SUS.

1. *Sus scrofa ferus*,
2. *Sus indicus ferus*.
3. *Sus leucomystax*.
4. *Sus barbatus*.
5. *Sus longirostris*.
6. *Sus verrucosus*.

## II. POTAMOCHÆRUS.

1. *Potamochoerus larvatus*.
2. *Potamochoerus penicillatus*.

## III. PHACOCHÆRUS.

1. *Phacochærus aliani*.
2. *Phacochærus pallasi*.

## IV. BABIRUSA.

*Babirusa alfurus*.

## V. PORCULA.

*Porcula salvania*.

## VI. DICOTYLES.

1. *Dicotyles labiatus*.
2. *Dicotyles torquatus*.

In Zool. Anz. xiv, pp. 457-459, NEHRING has notes on the Wild Pig of Mindoro, in the Philippines. This form, together with one from Luzon,

is the author's *S. celebensis*, v. *philippensis* (*S. philippensis* of Meyer), while that from Palawan, between Mindoro and Borneo, is his *S. barbatus*, v. *palavensis*.

## INCERTÆ ORDINIS.

†*Procynictis*, n. g., V. LEMOINE, Bull. Soc. Géol. (3) xix, p. 270, Low. Eocene, Rheims.

†*Protoproviverra paleonictides*, n. g. & sp., LEMOINE, t. c. p. 272, *ibid.*

†*Arctocyanides*, n. g., LEMOINE, t. c. p. 275, *ibid.*

†*Conaspidotherium*, n. g., LEMOINE, l. c., *ibid.*

†*Plesiesthonyx munieri*, n. g. & sp., LEMOINE, t. c. p. 276, *ibid.*

†*Adapisoriculus minimus*, n. sp., LEMOINE, t. c. p. 277, *ibid.*

†*Protoadapis curvicauspiciens*, n. g. & sp., LEMOINE, t. c. p. 284, *ibid.*

†*Protoadapis recticauspiciens*, n. sp., LEMOINE, l. c., *ibid.*

†*Lophiodochærus peroni*, n. g. & sp., LEMOINE, t. c. p. 287, *ibid.*

†*Protodichobune oweni*, n. g. & sp., LEMOINE, t. c. p. 288, *ibid.*

†*Protodichobune lydekkeri*, n. sp., LEMOINE, l. c., *ibid.*

## 7. CETACEA.

JOUAN, H. Apparition des Cétacés sur les Côtes de France. Bull. Soc. L. Norm. (4) v, pp. 137–164.

A record of all the occurrences of the various Cetaceans on the French coasts.

SOUTHWELL, T. W. Zool. (3) xv, pp. 121–126, has notes on the Whale fishery of 1890.

ZIETZ, A. A List of South Australian Whales and Dolphins. Tr. R. Soc. S. Austr. xiii, pp. 8 & 9 (1890).

7 species are recorded, among which is *Neobalæna marginata*, of which entire specimens have recently been obtained.

## A.—MYSTACOCETI.

## a. BALÆNIDÆ.

†*Balæna pampæa*, n. sp., F. AMEGHINO, Rev. Arg. Hist. Nat. i, pp. 166 & 167, Pleistocene, Bahia Blanca.

†*Notiocetus romerianus*, n. g. & sp., AMEGHINO, t. c. p. 167, *ibid.*

†*Notiocetus platensis*, n. sp., AMEGHINO, t. c. p. 255, Tertiary, La Plata.

*Balænoptera musculus*. W. CROUCH, Tr. Ess. Club, v, pp. 124–128, pl. iv, records and figures a female caught near Burnham in the river Crouch on Feb. 12. Length, 46 ft. 6 in.

E. D. COPE, P. Ac. Philad. 1891, pp. 474–478, describes a *Balænoptera* stranded on the coast of New Jersey, which he considers may be a distinct species from *B. musculus*, and if so may perhaps be the same as Gray's *B. duguidii*.

## B.—ODONTOCETI.

## b. PHYSETERIDÆ.

POUCHET, G., & BEAUREGARD, H. Sur un Cachalot Échoué a l'Île de Ré. J. de l'Anat. Phys. xxvii, pp. 117–133, pls. viii–ix.

These notes refer chiefly to the osteology, which is illustrated in the plates.

*Hyperoödon rostratus*: E. L. BOUVIER, C.R. cxiii, pp. 563–565, has notes on the anatomy of a female. P. J. VAN BENEDEN, Bull. Ac. Belg. (3) xxii, pp. 202–205, refers to a 'school' which appeared in the Channel in September, part of which entered the Thames and part visited the coast of Normandy.

CAPELLINI, G. Ziffioidi Fossili e il Rostro di Dioplodonte della Farnesina presso Roma. Mem. Acc. Bologn. (5) i, pp. 1–14, pl. i.

After notes on other fossil Ziphioids, describes the rostrum of a *Dioplodon* (*Mesoplodon*) from the Pliocene of Farnesina, as the representative of a new species.

† *Dioplodon farnesinæ*, n. sp., CAPELLINI, t. c. p. 12, Pliocene, Farnesina, near Rome.

## c. PLATANISTIDÆ.

↘ *Stenodelphis*, Gerv., to replace *Pontoporia*, Gray (preoccupied); F. AMEGHINO, Rev. Arg. Hist. Nat. i, p. 254.

↘ † *Pontivaga fischeri*, n. g. & sp., AMEGHINO, t. c. p. 165, Tertiary, Parana. Identified by BURMEISTER, An. Mus. B. Aires, iii, p. 460, with *Pontistes rectifrons*.

## d. DELPHINIDÆ.

SACCO, F. Sopra un Cranio di *Tursiops cortesii* (Desm.) var *astensis*, Sacc., dell'Astigiana. Atti. Acc. Tor. xxvi, pp. 703–711, figs.

Describes a new variety of this Dolphin.

† *Saurocetes obliquus*, n. sp., F. AMEGHINO, Rev. Arg. Hist. Nat. i, p. 163, Tertiary, Parana.

↘ † *Pontoplanodes*, n. n., AMEGHINO, t. c. p. 255, to replace *Saurocetes*, Burmeister (*non* Agassiz).

↘ † *Saurodelphis*, n. n., H. BURMEISTER, An. Mus. B. Aires, iii, p. 451, to replace *Saurocetes*.

↘ † *Ischyrorhynchus van-benedeni*, n. g. & sp., AMEGHINO, Rev. Arg. Hist. Nat. i, p. 163, Tertiary, Parana.

8. *SIRENIA*.

## RHYTINIDÆ.

BÜCHNER, E. Die Abbildungen der Nordischen Seekuh (*Rhytina gigas*, Zimm.). Mém. Ac. Pétersb. xxxviii, No. 7, pp. 1-24, pl.

Reproduces two figures, and a description of the *Rhytina* from the accounts of the voyage of Capt. Swen Waxell, preserved in the imperial Russian library. [See also F. LUCAS, *suprà*, p. 11.]

9. *EDENTATA*.

MERCERAT, A. Datos sobre Restos de Mamíferos Fósiles Pertenecientes á los Bruta. Rev. Mus. la Plata, ii, pp. 5-46.

Describes the remains of a number of Edentates from the Argentine Tertiaries, many of which are regarded as new. The memoir is criticized by AMEGHINO, Rev. Arg. Hist. Nat. i, pp. 346-382. [*Vide infra*.]

## a. MANIDÆ.

WEBER, M. Beiträge zur Anatomie und Entwicklung des genus *Manis*. In Weber's Zoologische Ergebnisse einer Reise in Niederländisch Ost-Indien, ii, 118 pp., 9 pls.

An exposition of the anatomy, development, and relationships of *Manis*. It is proposed to raise the *Squamata*, *Tubulidentata*, and *Xenarthra* to the rank of orders.

† *Palæomanis neus*, FORSYTH-MAJOR [Zool. Rec. xxv, *Mamm.* p. 57], shown by its founder, C.R., cxiii, p. 609, to have been established on a skull which is not Edentate.

## b. †MEGATHERIIDÆ.

CLAYPOLE, W. *Megalonyx* in Holmes County. Am. Geol. vii, pp. 122-132 & 149-153.

After recording a skeleton of *Megalonyx* from the district named, the author gives a general account of the *Megatheriidae* and their distribution. *Megalonyx* is considered to have lived to a late period, one skeleton retaining fragments of tendons.

LINDAHL, J. Description of a Skull of *Megalonyx leidy*. Tr. Am. Phil. Soc. (2) xvii, pp. 1-10, pls. i-v.

† *Megalonyx leidy*, n. sp., LINDAHL, l. c., Pleistocene, Kansas.

† *Megalonyx meridionalis*, n. sp., H. BURMEISTER, An. Mus. B. Aires, iii, p. 448, Tertiary, Argentina.

† *Scelidotherrum bravardi*, Lyd., considered by H. BURMEISTER, l. c. p. 479, as only sexually different from the type of *S. leptcephalum*.

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†*Scelidotherium laevidens*, n. sp., MORENO & MERCERAT, Rev. Mus. la Plata, i, p. 224, Mid. Tertiary, Catamarca.

†*Scelidotherium parvulum*, n. sp., MORENO & MERCERAT, *t. c.* p. 225, *ibid.*

†*Megatherium burmeisteri*, p. 225, *bergi*, p. 227, n. spp., MORENO & MERCERAT, *l. c.*, *ibid.*

†*Promegatherium*, Amegh., identified by BURMEISTER (*suprà*, p. 6) with *Megatherium*.

†*Promegatherium parvulum*, n. sp., F. AMEGHINO, Rev. Arg. Hist. Nat. i, p. 249, Tertiary, Argentina.

†*Ortotherium robustum*, †*schlosseri*, p. 151, †*seneum*, p. 152, Tertiary, Parana, AMEGHINO, Rev. Arg. Hist. Nat. i, n. spp.

†*Hapalops ru[e]ltimeyeri*, p. 153, †*elongatus*, †*crassidens*, †*angustipalatus*, †*robustus*, †*brevipalatus*, p. 316, †*diversidens*, †*longipalatus*, †*gracilidens*, †*subquadratus*, †*depressipalatus*, p. 317, †*testudinatus*, †*cylindricus*, †*minutus*, p. 318, Tertiary, Patagonia, AMEGHINO, Rev. Arg. Hist. Nat. i; *H. grandævus*, Tertiary, Argentina, A. MERCERAT, Rev. Mus. la Plata, ii, p. 13 : n. spp.

†*Parhapalops rectangularis*, n. g. & sp., AMEGHINO, Rev. Arg. Hist. Nat. i, p. 318, Tertiary, Parana.

†*Schismotherium patagonicum*, n. sp., MERCERAT, Rev. Mus. la Plata, ii, p. 9, Tertiary, Patagonia.

†*Stenocephalus australis*, n. g. & sp., MERCERAT, *t. c.* p. 10, *ibid* [name preoccupied.—R. L.], †*cognatus*, p. 11, †*hybridus*, p. 12, *id. ibid.*, n. spp.

This and the two preceding species are identified by AMEGHINO, Rev. Arg. Hist. Nat. i, p. 347, with *Hapalops*.

†*Trematherium nanum*, n. sp., AMEGHINO, *t. c.* p. 319, *ibid.*

†*Pseudhapalops observationis*, n. g. & sp., †*forticulus*, †*longitudinalis*, n. spp., *ibid.*, AMEGHINO, *t. c.* p. 319.

†*Amphihapalops congermanus*, n. g. & sp., p. 319, †*gallaicus*, †*cadeus*, n. spp., *ibid.* p. 320, AMEGHINO, *t. c.*

†*Geronops circularis*, n. g. & sp., AMEGHINO, p. 320, *ibid.*

†*Analcimorphus inversus*, n. g. & sp., AMEGHINO, *l. c.*, *ibid.*

†*Xyophorus sulcatus*, †*atlanticus*, †*andinus*, *ibid.*, AMEGHINO, *t. c.* p. 321 : n. spp.

†*Planops obesus*, n. sp., AMEGHINO, *l. c.*, *ibid.*

†*Paraplanops oblongus*, n. g. & sp., AMEGHINO, *l. c.*, *ibid.*

†*Eucholæops latirostris*, †*externus*, †*fronto*, †*litoralis*, p. 322, †*fissignathus*, p. 323, *ibid.*, AMEGHINO, *t. c.*; †*E. latifrons*, p. 15, †*lafossei*, p. 16, *ibid.*, MERCERAT, Rev. Mus. la Plata, ii : n. spp. The two last species are provisionally identified by AMEGHINO, Rev. Arg. Hist. Nat. i, p. 348, with his *E. fronto* and *E. externus*.

†*Peleciodon cristatus*, n. g. & sp., *ibid.*, †*robustus*, †*arcuatus*, †*petræus*, p. 323, †*maximus*, p. 324, n. spp., *ibid.*, AMEGHINO, *t. c.*

†*Metopotherium splendens*, n. g. & sp., AMEGHINO, *l. c.*, *ibid.*

†*Nematherium longirostris*, n. sp., AMEGHINO, *l. c.*, *ibid.*



† *Nematherium lavagnanum*, n. sp., MERCERAT, Rev. Mus. la Plata, ii, p. 26, *ibid.* Identified by AMEGHINO, Rev. Arg. Hist. Nat. i, p. 349, with *N. longirostris*.

✓† *Lymodon auca*, n. g. & sp., † *perfectus*, n. sp., *ibid.*, AMEGHINO, t. c. p. 348.

✓† *Analcitherium antarcticum*, n. g. & sp., AMEGHINO, t. c. p. 325, *ibid.*

✓† *Ammotherium profundatum*, n. g. & sp., AMEGHINO, l. c., *ibid.*

✓† *Menilaus affinis*, n. g. & sp., AMEGHINO, t. c. p. 154, Tertiary, Parana.

✓† *Hyperleptus garzonianus*, n. g. & sp., † *sectus*, n. sp., AMEGHINO, t. c. p. 155, Tertiary, Patagonia.

✓† *Tolmodus inflatus*, n. g. & sp., AMEGHINO, t. c. p. 157, *ibid.* On p. 258, t. c., declared to be Avian, and transferred to *Phororhachos*.

✓† *Prepotherium filholi*, n. g. & sp., p. 157, *potens*, n. sp., p. 325, *ibid.*, AMEGHINO, t. c.

✓† *Tapinotherium aquirrei*, n. g. & sp., A. MERCERAT, Rev. Mus. la Plata, ii, p. 17, Tertiary, Patagonia. Identified by AMEGHINO, Rev. Arg. Hist. Nat. i, p. 349, with *Hyperleptus sectus*.

† *Promylodon*, Amegh., identified by BURMEISTER (*suprà*, p. 6), with *Myllodon*.

† *Lestodon ortizianus*, n. sp., AMEGHINO, *op. cit.* pp. 158 & 159, Pleistocene, Argentina.

✓† *Sphenotherus zaveletianus*, n. g. & sp., Tertiary, Argentina, pp. 95–99, † *paranensis*, n. sp., Tertiary, Parana, p. 159, AMEGHINO, t. c.

✓† *Ranculus scalabrinianus*, n. g. & sp., AMEGHINO, t. c. p. 160, *ibid.*

✓† *Strabosodon acuticavus*, n. g. & sp., † *obtusicavus*, n. sp., *ibid.*, AMEGHINO, t. c. p. 161.

✓† *Hypocelus*, n. n., AMEGHINO, t. c. p. 250; to replace *Coelodon*, Lund, preoccupied. [The name *Nothotherium*, Lydekker, see Zool. Rec. xxvi, Mamm. p. 49, had already been substituted.—R. L.]

✓† *Catonyx*, n. n., AMEGHINO, l. c., to replace *Platyonyx*, Lund, preoccupied.

✓† *Euryosodon* [preoccupied, R. L.] *nasutus*, n. g. & sp., pp. 18 & 19, † *boulei*, p. 21, † *rostratus*, p. 22, n. spp., *ibid.*, MERCERAT, Rev. Mus. la Plata, ii. All the above are identified by AMEGHINO, Rev. Arg. Hist. Nat. i, p. 349, with forms previously described.

✓† *Eleutherodon* [preoccupied, R. L.] *heteroclitus*, n. g. & sp., MERCERAT, Rev. Mus. la Plata, ii, p. 24, *ibid.*

### C. MYRMECOPHAGIDÆ.

COUVREUR, —, & BALAILLON, —. Étude Anatomique sur le Myologie du Membre Postérieur du Grand Fourmilier (*Myrmecophaga jubata*). Ann. Soc. L. Lyon (2) xxxviii, pp. 82–90.

The musculature of the hind limb is described as departing widely from that of the ordinary pentedactyle type, and approaching that of Man.

## d. INCERTÆ SEDIS.

HUBRECHT, A. A. W. A New Mammal from Sumatra. *Nature*, xlv, p. 468, and *Notes Leyd. Mus.* xiii, pp. 241 & 242.

Describes a Mammal from Sumatra, of which the only known specimen is lost, as *Trichomanis hæveni*. It is said to be more closely allied to certain representatives of the Edentata than to any other order, and is described as follows: "Animal of the size of a very large Cat. Fur grey, with a black longitudinal band along the middle of the back. Snout elongated, and more or less conical, with a small mouth at the extremity. A long cylindrical tongue, which is thrust out, serves the animal in the collection of ants, which are its natural food. A more or less bushy tail. Ears not conspicuous. Legs higher than those of *Manis*; strong claws to the feet."

†*Trichomanis hæveni*, n. g. & sp., HUBRECHT, *Notes Leyd. Mus.* xiii, p. 241.

## e. DASYPODIDÆ.

MERCERAT, A. Nota sobre Algunas Especies de un Genero Aberrante de los *Dasyпода*. *Rev. Mus. la Plata*, ii, pp. 57-59.

The author first states that the genus *Cochlops*, AMEGHINO, is founded upon portions of the carapace of *Propaleohoplophorus*; after which he gives the characters of the genus *Peltephilus*.

SLADE, D. D. On the genus *Chlamydophorus*. *Am. Nat.* xxv, pp. 541-548, figs.

A general description of the anatomy of this genus.

†*Tatusia neogaea*, n. sp., F. AMEGHINO, *Rev. Arg. Hist. Nat.* i, p. 162, Tertiary, Argentina.

†*Vetelia puncta*, n. g. & sp., AMEGHINO, *t. c.* p. 162, Tertiary, Patagonia.

†*Prozædius*, n. g., AMEGHINO, *l. c.*, type *Zædius proximus*.

†*Praeuphractus sclabrinii*, n. sp., Mid. Tertiary, Catamarca, MORENO & MERCERAT, *Rev. Mus. la Plata*, i, p. 26; †*P. nanus*, p. 253, †*limus*, p. 254, n. spp., Tertiary, Patagonia, AMEGHINO, *Rev. Arg. Hist. Nat.* i.

†*Stenotatus karaiakensis*, n. g. & sp., AMEGHINO, *t. c.* p. 253, *ibid.*

†*Dasypus argentinus*, n. sp., MORENO & MERCERAT, *Rev. Mus. la Plata*, i, p. 223, Tertiary, Catamarca.

*Dasypus villosus*: note on its habits by E. PEARD, *Field*, lxxviii, p. 508.

*Cheloniscus*, Wagler, 1830, adopted by AMEGHINO, *op. cit.* p. 253, in place of *Prionodon*, F. Cuv., on the ground that the latter is preoccupied by *Prionodon*, Horsfield. [*Prionodon* dates from 1822, and *Prionodon*, 1824.—R. L.]

†*Lysiurus*, n. n., AMEGHINO, *t. c.* p. 254, to replace *Xenurus*, Wagler, preoccupied.

†*Eutatus prominens*, n. sp., MORENO & MERCERAT, *Rev. Mus. la Plata*, i, p. 222, Mid. Tertiary, Catamarca.

†*Eutatus delea*, †*carinatus*, n. spp., AMEGHINO, Rev. Arg. Hist. Nat. i, p. 254, Tertiary, Patagonia.

√†*Præutatus*, n. g., AMEGHINO, t. c. p. 327; type, *Eutatus ænophorum*, Amegh.

††*Thoracotherium priscum*, n. g. & sp., A. MERCERAT, Rev. Mus. la Plata, ii, pp. 42 & 43, Tertiary, Patagonia. This and the other two species are identified by AMEGHINO, Rev. Arg. Hist. Nat. i, p. 351, with *Præutatus*.

††*Thoracotherium vetum*, p. 44, †*cruentum*, p. 45, MERCERAT, t. c., *ibid.*, n. spp.

†*Chlamydothorium minutum*, n. sp., MORENO & MERCERAT, *op. cit.* p. 224, Mid. Tertiary, Catamarca.

†*Pampatherium*, AMEGHINO, adopted by its founder, Rev. Arg. Hist. Nat. i, p. 253, in place of *Chlamydothorium*, used by Bronn as a synonym for *Glyptodon*.

†*Pampatherium pygmaeum*, n. sp., AMEGHINO, t. c. p. 253, Low. Tertiary, Patagonia.

†*Peltephilus ferox*, n. sp., AMEGHINO, t. c. p. 327, *ibid.*

#### f. †GLYPTODONTIDÆ.

H. BURMEISTER, An. Mus. B. Aires, iii, pp. 462–468, describes the nasal region in this group, the carapace of *Dædicurus*, and the tail of *Glyptodon*.

*Eleutherocercus*, Koken, 1888, identified by BURMEISTER, t. c. pp. 480 & 481, with *Panochthus*.

†*Neuryurus proximus*, †*compressidens*, MORENO & MERCERAT, Rev. Mus. la Plata, i, p. 221, Mid. Tertiary, Catamarca : n. spp.

†*Plohophorus philippii*, n. sp., MORENO & MERCERAT, t. c. p. 221, *ibid.*

These three forms are provisionally identified by AMEGHINO, Rev. Arg. Hist. Nat. i, p. 201, with *P. ameghinii*, Moreno.

†*Plohophorus paranensis*, n. sp., F. AMEGHINO, Rev. Arg. Hist. Nat. i, p. 251, Tertiary, Parana.

√†*Sclerocalyptus*, n. n., AMEGHINO, l. c.; to replace *Hopliphorus*, Lund, preoccupied.

†*Protoglyptodon* (?) *solidus*, n. sp., AMEGHINO, t. c. p. 252, Tertiary, Parana.

†*Dædicurus equæ*, n. sp., AMEGHINO, l. c., Tertiary, Argentina.

†*Propalæhoplophorus minus* [or], AMEGHINO, t. c. p. 326, Tertiary, Patagonia; †*patagonicus*, MERCERAT, Rev. Mus. la Plata, ii, p. 40, *ibid.* : n. spp.

†*Propalæhoplophorus aratæ*, n. sp., MERCERAT, l. c., *ibid.*

†*Asterostenma*, AMEGHINO (1889), identified by MERCERAT, t. c. p. 28, with *Propalæhoplophorus*; this is negated by AMEGHINO, Rev. Arg. Hist. Nat. i, p. 350.

†*Cochlops debilis*, n. sp., AMEGHINO, Rev. Arg. Hist. Nat. i, p. 326, *ibid.*

√†*Euclinepeltus petesatus*, n. g. & sp., AMEGHINO, l. c., *ibid.*

## NOTE.

*Phorusrhachos*, AMEGHINO, 1887 (Zool. Rec. xxiv, *Mamm.* p. 52), is found by its describer, Rev. Arg. Hist. Nat. i, p. 255, to be Avian; the name is amended to *Phororhachos*.

## 10. MARSUPIALIA.

LECHE, W. Zur Morphologie der Beutelknochen. Biol. Fören. iii, pp. 120-126, fig.

After showing that the Marsupial bones have a cartilaginous connection with the pubis, the author concludes that they represent the epipubis of lower vertebrates.

## A.—DIPROTODONTIA.

## a. PHASCOLOMYIDÆ.

DE VIS, C. W. Remarks on Post-Tertiary *Phascolomyidæ*. P. Linn. Soc. N.S.W. (4) vi, pp. 235-246.

The author denies the identity of *Sceparnodon* with *Phascolonus*, but regards the latter as a valid genus. Of the species of *Phascolomys*, *P. thomsoni* is regarded as invalid, the identity of *P. platyrhinus* with *P. mitchelli* is disputed, and a new species is named.

— The Incisors of *Sceparnodon*. T. c. pp. 258-262, pl. xxii.

The author considers that some of the teeth figured as upper incisors of this form really belong to the lower jaw, and consequently that the genus is distinct from *Phascolonus*. A presumed young lower incisor, and an adult upper incisor are figured.

LYDEKKER, R. On the Generic Identity of *Sceparnodon* and *Phascolonus*. P. R. Soc. xlix, pp. 60-64, pl. i.

Concludes that the upper incisors on which the first-named genus was established, are referable to the Wombat described as *Phascolonus*.

†*Phascolomys angustidens*, n. sp., DE VIS, P. Linn. Soc. N.S.W. (4) vi, p. 243, Pleistocene, N.S. Wales.

## b. †NOTOTHERIIDÆ.

DE VIS, C. W. In Confirmation of the Genus *Owenia*, so-called. P. Linn. Soc. N.S.W. (4) vi, pp. 159-165, pl. xii.

Describes and figures a mandibular ramus which is regarded as proving the distinctness of *Euowenia* (*Owenia*) from *Nototherium*. Although the specimen figured receives a new specific name, it is suggested that it may prove identical with *Nototherium victorie*, Owen. It is considered that *Euowenia*, *Nototherium*, *Diprotodon*, and *Zygomaturus* are all members of a single family.

† *Euowenia*, n. n., DE VIS, P. Linn. Soc. N.S.W. (4) vi, p. 160, to replace *Owenia*, preoccupied.

† *Euowenia robusta*, n. sp., DE VIS, l. c., Pleistocene, Victoria.

### c. MACROPODIDÆ.

LYDEKKER, R. On the Lower Jaws of *Procoptodon*. Q. J. Geol. Soc. xlvii, pp. 571-574, pl. xxi.

After reviewing Owen's writings upon the extinct Kangaroos, for which he established the genus *Procoptodon*, the author describes two mandibular rami from the clay beds in the neighbourhood of Bingera, N.S.W., which belong to this genus, and from their characters and a comparison of them with the lower jaws in the British Museum, he maintained that they indicate two distinct species of the genus, for which he retained the names *P. rapha*, Ow., and *P. goliath*, Ow., though it is possible that the types of those two species are really specifically identical, in which case the name *P. pusio*, Ow., might have to be adopted for one of the species described.

*Macropus rufus*: MATZDORFF, Helios, ix, pp. 26 & 27, has notes on the birth and development of the young.

## B.—POLYPROTODONTIA.

### d. DASYURIDÆ.

BEDDARD, F. E. On the Pouch and Brain of the Male Thylacine. P. Z. S. 1891, pp. 138-145.

The presence of a rudimentary pouch is indicated, and notes added on the transitory existence of a similar organ in the young of some other Marsupials. The brain is described and figured.

LECHE, W. Beiträge sur Anatomie des *Myrmecobius fasciatus*. Biol. Fören. iii, pp. 136-154.

The author confirms the relationship of *Myrmecobius* to the *Dasyuridae*, although in some respects it is more specialized than the other members of the family. By its dentition it is, however, closely connected with Mesozoic forms.

√ † *Prothylacinus patagonicus*, n. g. & sp., F. AMEGHINO, Rev. Arg. Hist. Nat. i, p. 312, Tertiary, Patagonia.

√ † *Protoproviverra manzaniana*, n. g. & sp., p. 312, *tensidens*, *†robusta*, n. spp., p. 313, *ibid.*, AMEGHINO, t. c. [Name preoccupied by LEMOINE, *suprà*, p. 47.—R. L.]

√ † *Perathereutes pungens*, n. g. & sp., *†obtusius*, *†amputans*, n. spp., *ibid.*, AMEGHINO, p. 313, t. c.

## e. DIDELPHYIDÆ.

† *Didelphys curvidens*, n. sp., H. BURMEISTER, An. Mus. B. Aires, iii, pp. 379 & 380, pl. vii, fig. 1, Tertiary, Argentina.

† *Notocynus hermosicus*, n. g. & sp., A. MERCIERAT, Rev. Mus. la Plata, ii, p. 80, Middle Tertiary, Monte Hermoso. Described as a Creodont, but identified by AMEGHINO, Rev. Arg. Hist. Nat. i, pp. 437 & 438, with *Didelphys triforata*.

## f. NOTORYCTIDÆ.

SCLATER, P. L. On the New Mole-like Marsupial (*Notoryctes typhlops*). Nature, xlv, p. 449.

STIRLING, E. C. On *Notoryctes typhlops*. P. Z. S. 1891, pp. 327-329, fig.

The dental formula is here given as  $i_{\frac{3}{2}}^3, c_{\frac{1}{1}}^1, m_{\frac{6}{5}}^6$  (?  $p_{\frac{2}{1}}^2, m_{\frac{4}{4}}^4$ ), which is different to the one in the following paper.

— Description of a New Genus and Species of *Marsupialia* (*Notoryctes typhlops*). Tr. R. Soc. S. Austr. 1891, pp. 154-187, pls. ii-ix.

Describes and figures a new mole-like Polyprotodont Marsupial from the deserts of Central Australia, under the above name. The dental formula is given as  $i_{\frac{3}{2}}^3, c_{\frac{1}{1}}^1, p_{\frac{2}{3}}^2, m_{\frac{4}{4}}^4 = \frac{22}{20}$ .

— Further Notes on the Habits and Anatomy of *Notoryctes typhlops*. T. c. pp. 283-291, pl. xii.

TEGETMEIER, W. B. The Mole-like Marsupial (*Notoryctes typhlops*). Field, lxxviii, p. 475, figs.

TROUESSART, E. Le *Notoryctes typhlops*, Nouveau Type de Marsupiaux Fousseurs originaire du Désert Australien. La Nature, 1891, pp. 290-294, woodcuts.

A fully illustrated descriptive account. [See also OGILBY, *suprà*, p. 14, by whom the dental formula is given as  $i_{\frac{3}{2}}^3, c_{\frac{0}{0}}^0, p_{\frac{2}{3}}^2, m_{\frac{4}{4}}^4 = \frac{22}{20}$ .]

↘ *Notoryctes typhlops*, n. g. & sp., STIRLING, Tr. R. Soc. Austr. l. c., Central Australia.

## 11. †MULTITUBERCULATA.

AMEGHINO, F. Los Plagiaulacideos Argentinos, y sus Relaciones Zoológicas, Geológicas, y Geográficas. Rev. Arg. Hist. Nat. i, pp. 38-44.

A reprint of the memoir quoted in Zool. Rec. xxvii, *Mamm.* p. 50.

In Rev. Arg. Hist. Nat. i, p. 304, the above author states that in the South American forms the tooth usually reckoned as the fourth lower premolar is really the first molar, and that the same holds good for the European *Plagiaulacideæ*.

## a. †PLAGIAULACIDÆ.

†*Plagiulax dawsoni*, n. sp., A. S. WOODWARD, P. Z. S. 1891, pp. 585 & 586, fig., Wealden, Hastings.

✓†*Neoctenacodon*, n. g., V. LEMOINE, Bull. Soc. Géol. (3) xix, p. 289, Low. Eocene, Rheims.

## b. †ABDERITIDÆ.

†*Abderites crassignathus*, †*serratus*, p. 248, *tenuissimus*, p. 304, n. spp., Tertiary, Patagonia, AMEGHINO, Rev. Arg. Hist. Nat. i.

## c. †EPANORTHIDÆ.

†*Acestis elatus*, p. 304; †*parvus*, p. 305, n. spp., Tertiary, Patagonia, F. AMEGHINO, Rev. Arg. Hist. Nat. i.

✓†*Decastis columnaris*, n. g. & sp., †*trurigenus*, n. sp., *ibid.*, AMEGHINO, p. 305, t. c.

†*Epanorthus ambiguus*, †*lepidus*, †*inæqualis*, *ibid.*, AMEGHINO, p. 305, n. spp.

✓†*Callomenus intervalatus*, n. g. & sp., AMEGHINO, t. c. p. 306, *ibid.*

✓†*Halmadromus vagans*, n. g. & sp., AMEGHINO, l. c. *ibid.*

✓†*Halmaselus valans*, n. g. & sp., AMEGHINO, l. c., *ibid.*

✓†*Essoprion coruscus*, n. g. & sp., AMEGHINO, l. c., *ibid.*

†*Essoprion consumptus*, n. sp., AMEGHINO, l. c., *ibid.*

†*Pichipilus exilis*, n. sp., AMEGHINO, t. c. p. 307, *ibid.*

## d. †GARZONIIDÆ.

✓†*Garzonia typica*, n. g. & sp., †*annectens*, p. 307, †*captiva*, †*minima*, p. 308, n. spp., Tertiary, Patagonia, F. AMEGHINO, Rev. Arg. Hist. Nat. i.

✓†*Halmarhiphus didelphoides*, n. g. & sp., AMEGHINO, l. c., *ibid.*

†*Halmarhiphus nanus*, n. sp., AMEGHINO, l. c., *ibid.*

## e. †MICROBIOTHERIIDÆ.

✓†*Stylognathus diprotodontoides*, n. g. & sp., F. AMEGHINO, Rev. Arg. Hist. Nat. i, p. 309, Tertiary, Patagonia.

†*Microbiotherium forticulum*, n. sp., AMEGHINO, l. c., *ibid.*

†*Eodidelphys fortis*, n. g. & sp., AMEGHINO, t. c. p. 310, *ibid.*

✓†*Eodidelphys famula*, n. sp., AMEGHINO, l. c., *ibid.*

✓†*Prodidelphys acicula*, n. g. & sp., †*pavita*, p. 310, †*obtusa*, p. 311, *ibid.*, n. spp., AMEGHINO, t. c.

✓†*Hadorhynchus tortor*, n. g. & sp., †*torvus*, †*conspicuus*, n. spp., *ibid.*, AMEGHINO, l. c.

12. *MONOTREMATA.*

KLAATSH, H. Ueber die Beziehungen zwischen Mammartasche und Marsupium. Morph. JB. xvii, pp. 483-488.

A discussion as to the relation of the depressions containing the mammæ of the Marsupials and Monotremes to the marsupium.

## ORNITHORHYNCHIDÆ.

STEWART, C. On a Specimen of the True Teeth of *Ornithorhynchus*. Q. J. Micr. Soc. xxxiii, pp. 229-231, pl. viii.

Describes and figures a skull, showing three teeth in position in each jaw, thus proving the complete dental formula to be  $\frac{3}{3}$ .

SYMINGTON, J. On the Nose, the Organ of Jacobson, and the Dumbbell-Shaped Bone in the *Ornithorhynchus*. P. Z. S. 1891, pp. 575-584, pls. xliii & xliv.

The anterior part of the nasal chamber is shown to be divided into three compartments by horizontal septa ; Jacobson's organ is described as being more developed than in any other Mammal, and, indeed, probably more so than in Lizards ; while the "dumbbell shaped" bone is proved to be formed by the coalescence of the inner moieties of the premaxillæ.

## INCERTÆ ORDINIS.

† *Mesitherium*, Trouessart, 1883, adopted by F. AMEGHINO to replace the later *Macropristis*, Amegh. [Zool. Rec. xxvi, *Mamm.* p. 55].

‡ *Anantiosodon rarus*, n. g. & sp., AMEGHINO, Rev. Arg. Hist. Nat. i, p. 327, Tertiary, Patagonia.



# A V E S.

BY

R. BOWDLER SHARPE, LL.D.

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Two main facts strike the Recorder, when considering the work done in the cause of Ornithology during the year 1891. One of these is the practical outcome of the gathering of Ornithologists of all countries at the Second International Congress at Budapest, which resulted in the publication of some really valuable Memoirs ; and, secondly, the increased attention which has been given to fossil forms. Mr. Lydekker's 'Catalogue of the Fossil Birds in the British Museum' marks an epoch in Avian Palæontology, and some remarkable discoveries have also been made by Argentine naturalists. Although considerable divergence of opinion exists with regard to the determination of some of the species, there can be no doubt that in the deposits of the Argentine Republic and Patagonia lie hidden many remarkable forms, the correct description of which cannot but have a powerful influence on the history of the class '*Aves*,' as in no other class of animals has the 'imperfection of the Geological Record' been more keenly felt.

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## I.—THE GENERAL SUBJECT,\*

WITH TITLES OF SEPARATE WORKS AND OF THE MORE IMPORTANT  
PAPERS PUBLISHED IN PROCEEDINGS OF SOCIETIES, &c.

Fourth Report of the Committee, consisting of PROFESSOR FLOWER (Chairman), Mr. D. MORRIS (Secretary), Mr. CARRUTHERS, Dr. SCLATER, Mr. THISELTON-DYER, Dr. SHARP, Mr. F. DU CANE GODMAN, PROFESSOR NEWTON, Dr. GÜNTHER, and COLONEL FEILDEN, appointed for the purpose of reporting on the present state of our knowledge of the Zoology and Botany of the West

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\* An asterisk prefixed to a quotation indicates that the Recorder has not seen the journal or work referred to.

- India Islands, and taking steps to investigate ascertained deficiencies in the Fauna and Flora. Rep. Brit. Ass. 1891, pp. 354-357. [*Cf. Zool. Rec.* xxvii, *Aves*, p. 2.]
- Draft Report of the Committee, consisting of PROFESSOR FLOWER (Chairman), Mr. D. SHARP (Secretary), Dr. BLANFORD, Dr. HICKSON, PROFESSOR NEWTON, PROFESSOR RILEY, Mr. O. SALVIN, and Dr. SCLATER, appointed to report on the present state of our knowledge of the Zoology of the Sandwich Islands, and to take steps to investigate ascertained deficiencies of the Fauna. *T. c.* pp. 357-358. [*Cf. Zool. Rec.* xxvii, *Aves*, p. 2.]
- Ä. O. U. Check-List of North American Birds. Third Supplement. *Auk*, viii, pp. 83-90.
- Beobachtungen an Vögeln und Insekten. JB. fürstl.-phänol. Stationen Deutschlands. v. Jahrgang, 1889, pp. 82-114.
- Bibliographie der Biologischen Litteratur Schwedens 1890. *Biol. Fören.* Stockh. 1891, pp. 166-168.
- Regeln für die zoologische Nomenclatur, angenommen von der Allgemeinen Deutschen Ornithologischen Gesellschaft zu Berlin. J. f. O. 1891, pp. 315-329.
- Century Dictionary, The. An Encyclopædic Lexicon of the English Language. Prepared under the superintendence of W. D. WHITNEY. Vols. i-vi [completing the work], 1883-1891.
- The articles on Birds, which are beautifully illustrated, are by Professor ELLIOT COUES.
- ADAMS, C. F. [See ELLIOT, D. G.]
- AITKEN, E. H. The Migration of Birds. *J. Bomb. N. H. Soc.* vi, pp. 268-270.
- ALLEN, F. H. Summer Birds of the Bras D'Or Region of Cape Breton Island, Nova Scotia. *Auk*, viii, pp. 164-166.
- ALLEN, J. A. The American Ornithologist's Union. A Seven Years' Retrospect. New York: 8vo, pp. 1-19.
- Description of a new species of *Mimocichla* from the Island of Dominica, West Indies. *Auk*, viii, pp. 217 & 218.  
[*Turdidae*, p. 63.]
- Further Notes on Maximilian Types of South American Birds. *Bull. Am. Mus. Nat. Hist.* iii, pp. 199-202.
- On a collection of Birds from Chapada, Matto Grosso, Brazil, made by Mr. Herbert H. Smith. Part i. *Oscines*. *T. c.* pp. 337-380.  
[*Tanagridæ*, p. 58; *Emberizinae*, p. 59.]
- ALTUM, E. Jugendkleider einiger Hühnerarten. *J. f. O.* 1891, pp. 92-104.  
[*Phasiani*, p. 35.]
- Die Mauser der jungen Edelfasanen. *T. c.* pp. 130-139.  
[*Phasianidae*, p. 35.]

- AMEGHINO, F. Mamíferos y Aves Fósiles Argentinas. Especies nuevas, adiciones y correcciones. Rev. Argent, i, pp. 240-259.
- Enumeration de los Aves Fósiles de la Republica Argentina. T. c. pp. 441-453.
- ANDREW, J. Remarks on a recent proposal to introduce Ostriches into Tasmania. P. R. Soc. Tasm. 1890, pp. 176-184.  
[*Struthioniformes*, p. 33.]
- ANTHONY, A. W. Notes on the Cactus Wren. Zoe, ii, pp. 133 & 134.  
[*Troglodytidae*, p. 65.]
- APLIN, O. V. The Distribution in the British Islands of the Spotted Crake. Zool. xlix, pp. 88-96.  
[*Rallidae*, p. 37.]
- The Coloration of Pallas's Shrike. T. c. p. 187. [*Laniidae*, p. 62.]  
[See also *Motacillidae*, p. 60.]
- ATTEMS, K. Graf. Zur Ornithologie von Graz. Orn. Jahrb. ii, pp. 151-163.
- BACKHOUSE, J. Winter notes from Corsica. Zool. xlix, pp. 371-376.
- BAINES, A. C. On the Soaring of Birds. Nature, xlv, pp. 520 & 521.  
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## II.—SPECIAL SUBJECTS.

### A. FAUNISTIC.

PALÆARCTIC REGION. See Borrer, Brusina, Blasius, Bund, Chernel, Christy, Collett, Cordeaux, Deyrolle, Dombrowski, Dresser, Floericke, Frivaldsky, Gätke, Giglioli, Hagerup, Hartwig, Herman, Lilford, Madarasz, Massa, Ogilvie-Grant, Olphe-Galliard, Pidsley, Pleske, Reiser, Schalow, Schrader, Seebohm, Sharpe, Slater, Stejneger, Styan, Taczanowski, Tschusi.

ETHIOPIAN REGION. See Barboza du Bocage, Emin, Hartert, Hartlaub, Jackson, Reichenow, Sharpe, Sibree.

INDIAN REGION. See Büttikofer, Elliot, Hartert, Steere, Vorderman.

AUSTRALIAN REGION. See Buller, De Vis, Lister, Meyer, Salvadori, Wilesworth, Wilson.

NEARCTIC REGION. See Brewster, Chapman, Loomis, Macfarlane, Maynard, Merriam, Turner, Warren.

NEOTROPICAL REGION. See Allen, Chapman, Cherrie, Cory, Godman, Gündlach, Herrera, Holland, Kerr, Oustalet, Quelch, Ridgway, Riker, Selater, Scott.

## B.—ANATOMY AND MISCELLANEOUS.

ANATOMY. See Beddard, Finn, Fürbringer, Haij, Lavocat, Lucas, Parker, Zehntner.

OSTEOLOGY. See Ameghino, Forbes, Lydekker, Lucas, Mercerat, Moreno, Shufeldt.

OOLOGY. See Barnes, Campbell, Davidson, Lovassy, Macfarlane, North, Price, Sclater (W. L.).

NEOSSOLOGY. See Altum, Evans.

PTERYLOGRAPHY. See Chapman, Goodchild, Hoffheinz.

BIOGRAPHY. See Charbonnier, Coues, Eudes-Deslongchamps, Gattcombe, Goss, Hancock, Kutter, Meves, Parker, Pelzeln, Taczanowski.

LITERATURE. See Entz, Floericke.

CLASSIFICATION. See Dubois, Hartert, Sharpe, Shufeldt.

GEOGRAPHICAL DISTRIBUTION. Palacky, Palmen, Sclater.

## III.—SYSTEMATIC.

## Subclass RATITÆ.

## Order RHEIFORMES.

## Family RHEIDÆ.

†*Protorhea*, n. g. (fossil). Type, *P. azarae*, n. sp. (fossil) ; F. P. MORENO & A. MERCERAT, An. Mus. La Plata, i, p. 27, pl. xix, fig. 17. [Is founded on the bone of a Guanaco (*Auchenia lujanensis*) ; F. AMEGHINO, Rev. Arg. i, p. 448.]

*Rhea subpampeana*, n. sp. (fossil), Argentina, *id. t. c.* p. 27, pl. xix, fig. 22. [= *R. americana*, F. AMEGHINO, Rev. Arg. i, p. 448.]

*Rhea pampeana*, n. sp. (fossil), *id. t. c.* pp. 27 & 28, pl. xix, figs. 1, 3-10, & 13, pl. xx, figs. 1-4 & 6-17, pl. xxi, figs. 1-4. [= *R. fossilis*, Amegh. (*nee* Mor. & Merc.) ; F. AMEGHINO, Rev. Arg. i, p. 448.]

*Rhea fossilis*, n. sp. (fossil), *id. t. c.* p. 28, pl. xix, figs. 2, 11, & 16, pl. xx, fig. 20, pl. xxi, fig. 6. [= *R. americana*, F. AMEGHINO, Rev. Arg. i, p. 448.]

## Family PHORORHACOSIDÆ.

Characters of the family ; F. AMEGHINO, Rev. Arg. i, pp. 258, 449, & 450.

*Brontornis* (*infra*, p. 44) and *Rostrornis* (*infra*, p. 44) identical ; *id. t. c.* p. 450.

†*Phororhacos*, n. g. (fossil), *id. t. c.* p. 256. [Syn. *Tolmodus*, *id. t. c.* p. 157 ; *Palæociconia*, Amegh., *cf.* LYDEKKER, Cat. Fossil B. p. 64 ; *Mesembriornis* (*infra*, p. 45) ; *Stereornis* (*infra*, p. 45) ; *Patagornis* ; *Dryornis* ; *Darwinornis* (*infra*, p. 45) ; *Owenornis* (*infra*, p. 45) ; *Psilopterus*, pt. (*infra*, p. 45).]



*Phororachos longissimus*, Amegh. : remarks on synonymy ; F. AMEGHINO, Rev. Arg. i, pp. 258 & 451. [Syn. *Stereornis rollieri* (infrà, p. 45); *S. gaudryi* (infrà, p. 45); *Darwinornis copei* (infrà, p. 45); *Owenornis lydekkeri* (infrà, p. 45).]

*Phororachos shenensis*, n. sp. (fossil), Lower Eocene of S. Patagonia, *id. t. c.* pp. 258 & 285. [= *Mesembryornis studeri* (infrà, p. 45); *M. quattrefagei* (infrà, p. 45); *Darwinornis zitelli* (infrà, p. 45); *D. socialis* (infrà, p. 45); *Owenornis affinis* (infrà, p. 45).]

*Phororachos milne-edwardsii* (infrà, p. 45) : remarks on ; *id. t. c.* p. 452. [= *Palæociconia australis* (infrà, p. 45); *Dryornis pampeanus* (infrà p. 45).]

*Phororachos inflatus*, n. sp. (fossil), Lower Eocene of S. Patagonia, *id. t. c.* p. 258. [= *Tolmodus inflatus*, *id. ibid.* p. 157, = *Patagornis marshii* (infrà, p. 45).]

*Palæociconia cristata* (infrà, p. 42), *P. delicatus*, n. sp. (fossil), Eocene of S. Patagonia, *id. t. c.* pp. 259 & 452. [= *Patagornis lemoinei* (infrà, p. 45); *P. bachmani* (infrà, p. 45); *Psilopterus intermedius* (infrà, p. 45).]

*Palæociconia platygnathus*, n. sp. (fossil), Lower Eocene of S. Patagonia, *id. t. c.* pp. 452 & 453.

†*Opisthodactylus*, n. g. (fossil). Type, *O. patagonicus*, n. sp., Lower Eocene of S. Patagonia ; *id. t. c.* p. 453.

### Family PELECYORNIDÆ.

Characters of this new family ; F. AMEGHINO, Rev. Arg. i, p. 448. To it are referred the species of *Psilopterus* of Moreno & Mercerat, placed by the latter authors with the *Cathartides* [vide infrà, p. 45].

†*Pelecyornis*, n. g. [= *Psilopterus*, pt., Mor. & Merc., vide infrà, p. 45]; *id. t. c.* p. 448. *P. minutus*, n. sp. (fossil), Lower Eocene of Patagonia, *id. t. c.* p. 449.

†*Lophiornis*, n. g. Type, *L. obliquus*, n. sp. (fossil), Lower Eocene of S. Patagonia ; *id. t. c.* p. 448.

†*Anisolornis*, n. g. Type, *A. excavatus*, n. sp. (fossil), Lower Eocene of S. Patagonia ; *id. t. c.* p. 449.

### Order STRUTHIONIFORMES.

*Struthio camelus* : notes on farming : J. ANDREW, P. R. Soc. Tasm. 1890, pp. 176-184.

### Order CASUARIIFORMES.

*Casuarius galeatus* : notes on its anatomy ; v. THÉBAULT, Bull. Soc. Philom. (8) iii, pp. 198-210.

## Order DINORNITHIFORMES.

DE VIS, C. W. The Moa in Australia. N. Z. J. Sci. (2) i, pp. 97-101.

FORBES, H. O. Note on the Disappearance of the Moa. Tr. N. Z. Inst. xxiii, pp. 373-375.

SMITH, W. W. On the occurrence of Moa and other Remains at Albury. N. Z. J. Sci. (2) i, pp. 194-198.

*Dinornis excelsus*, n. sp., North Island, N. Z., F. W. HUTTON, N. Z. J. Sci. (2) i, p. 247. *D. firmus*, n. sp., North Island, *id. t. c.* p. 247. *D. validus*, n. sp., South Island, *id. t. c.* p. 247. *D. excelsus*, n. sp., North Island, *id. t. c.* p. 247. *D. potens*, n. sp., South Island, *id. t. c.* p. 248.

*Megalapteryx tenuipes*, n. sp., South Island, N. Z., R. LYDEKKER, Cat. Fossil B. Brit. Mus. p. 251.

*Anomalopteryx antiquus*, n. sp., Timaru, F. W. HUTTON, N. Z. J. Sci. (2) i, p. 248.

† *Mesopteryx*, n. g. Type, *D. didinus*, Owen; *id. t. c.* p. 249.

† *Tylopteryx*, n. subg. Type, *D. gracilis*, Owen; *id. t. c.* p. 248.

*Emeus gravipes*, nom. emen. pro *Dinornis gravis*, Owen (pt.); R. LYDEKKER, Cat. Fossil B. Brit. Mus. p. 298.

*Euryapteryx* [= *Emeus*†] *pygmaeus*, n. sp., South Island, N. Z., F. W. HUTTON, N. Z. J. Sci. (2) i, p. 249. *E.* [= *E.*†] *ponderosus*, n. sp., South Island, *id. t. c.* p. 249.

*Palapteryx plenus*, n. sp., South Island, *id. t. c.* p. 248.

† *Pachyornis*, n. g. (fossil). Type, *P. elephantopus*, Owen; R. LYDEKKER, Cat. Fossil B. Brit. Mus. p. 316. *P. immanis*, n. sp. (fossil), *id. t. c.* p. 343. *P. rothschildi*, n. sp., ? North Island, New Zealand, *id. P. Z. S.* 1891, pp. 479-486, pl. xxxviii.

† *Hypselornis*, n. g. (fossil). Type, *H. sivalensis*, n. sp.; *id.* Cat. Fossil B. Brit. Mus. p. 354.

## Order APTERYGIFORMES.

PARKER, T. J. On the History of the Kiwi. N. Z. J. Sci. (2) i, pp. 2-9 & 66-68.

† *Pseudapteryx*, n. g. (fossil). Type, *P. gracilis*, n. sp., New Zealand; R. LYDEKKER, Cat. Fossil B. Brit. Mus. p. 218.

## Subclass CARINATÆ.

## Order CRYPTURIFORMES.

*Tinamotis ingoufi*, n. sp., Patagonia, E. OUSTALET, Miss. Sci. Cap Horn, Ois. pp. 105 & 106, pl. i.

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† Cf. LYDEKKER, Cat. Fossil Birds Brit. Mus. p. 297.

## Order GALLIFORMES.

## Suborder MEGAPODII.

*Megapodius brunneiventris*, n. sp., Eastern New Guinea, A. B. MEYER, Abh. zool. Mus. Dresden, 1891, No. 4, p. 15. *M. duperreyi* in the Kangean Archipelago; A. G. VORDERMAN, Nat. Tijdschr. Nederl. Ind. xlix, pp. 71-73; 1, pp. 520-524.

*Tallegallus longicaudus*, n. sp., Eastern New Guinea; A. B. MEYER, Abh. zool. Mus. Dresden, 1891, No. 4, p. 15.

## Suborder PHASIANI.

ALTUM, E. Jugendkleider einiger Huhnerarten. J. f. O. 1891, pp. 92-104.

## Family PHASIANIDÆ.

*Phasianus colchicus*, its moults and changes of plumage; E. ALTUM, J. f. O. 1891, pp. 130-139.

*Polyplectron nehrkornæ*, n. sp., Paláwan; W. BLASIUS, MT. orn. Ver. Wien, 1891, pp. 1-2; *id.* J. f. O. 1891, p. 10.

*Phasianus humix*, from Upper Burma; W. L. SCLATER, Ibis, 1891, p. 152.

## Family TETRAONIDÆ.

*Tetrao tetrix*: notes on hybrids; T. LORENZ, J. f. O. 1891, pp. 405-412. *T. tetrix*, n. subsp. *viridanus*, W. Siberia; *id.* t. c. pp. 366-368. *T. medius*: young described; A. B. MEYER, t. c. p. 313. *T. bonasiotetrix*, hybrid, K. G. KOLTHOFF, Cefv. Ak. Föhr. 1891, p. 196.

*Lagopus scoticus*, figured; LORD LILFORD, Col. Fig. Br. Birds, part xviii.

*Pediocætes lucasi* and *P. nanus*, n. spp. (fossil), R. W. SHUFELDT, Auk, viii, p. 367.

*Palæotetrix*, n. g. (fossil). Type, *P. gilli*, n. sp., *id.* t. c. p. 367.

## Family PERDICIDÆ.

SCHAECK, F. DE. Monographie des Francolins. Mém. Soc. Zool. iv, pp. 272-392.

*Tetraogallus himalayanus*, figured; R. B. SHARPE, Sci. Results Yark. Miss., Aves, pl. xv.

*Palæortyx cayluxensis*, n. sp. (fossil), France; R. LYDEKKER, Cat. Fossil B. Brit. Mus. p. 138.

*Perdix cinerea*: curious variety; A. B. MEYER, J. f. O. 1891, pp. 271-275.

*Pternistes humboldti*, notes on; W. R. OGILVIE-GRANT, Ann. N. H. (6) vii, pp. 144-147.

*Francolinus hildebrandti*, note on; *id.* t. c. pp. 144-147. *F. jacksoni*, n. sp., Kikuyu, E. Africa (pp. 123 & 124), *F. gedgii*, n. sp., Elgon Plains (pp. 124 & 125), *F. elgonensis*, n. sp., Mt. Elgon (p. 126), *F. streptophorus*, n. sp., Mt. Elgon (p. 127), *id.* Ibis, 1891.

*Synoicus sordidus*, egg figured ; A. J. CAMPBELL, P. R. Soc. Vict. (n.s.) iii, pl. i, fig. 6.

*Coturnix emini*, n. sp., Bukoba, Victoria Nyanza ; A. REICHENOW, Ber. Allg. Deutschl. Orn. Ges. ix, pp. 33 & 34.

#### Suborder HEMIPODII.

*Pedionomus torquatus* : its anatomy ; H. GADOW, Rec. Austral. Mus. i, No. 10, pp. 205-211.

*Turnix taigoor*, *T. joudera*, and *T. dussumieri* : eggs figured ; H. E. BARNES, J. Bomb. N. H. Soc. vi, pl. to p. 1, figs. 832, 834, & 835. *T. melanotus* : nidification ; A. J. NORTH, Rec. Austral. Mus. 1, No. 9, p. 195.

#### Suborder PTEROCLETES.

*Syrnhaptes paradoxus* in Berwickshire ; G. BOLAM, Hist. Berwick Nat. Club, xii, pt. 2, pp. 542-551. In captivity ; F. E. BLAAUW, Ibis, 1890, pp. 465 & 466. Figured ; LORD LILFORD, Col. Fig. Br. Birds, part xvii. Literature : P. LEVERKÜHN, MB. Deutsch. Ver. Schutze, xvi, pp. 110-143.

#### Order COLUMBIFORMES.

SHUFELDT, R. W. On the Comparative Osteology of the United States' *Columbidae*. P. Z. S. 1891, pp. 194-196.

—, Notes of the Classification of the Pigeons. Am. Nat. xxx, pp. 157 & 158.

WIGLESWORTH, L. W. On the Polynesian Members of the Genus *Ptilopus*. Ibis, 1891, pp. 566-584, pl. xi.

18 species recognized and full synonymy given, with 'Key' to the species. *P. clementinæ*, figured [pl. xi].

*Columba enas*, figured ; LORD LILFORD, Col. Fig. Brit. Birds, part xx. *C. livia* in the Hebrides ; C. BOLLE, Orn. Jahrb. ii, pp. 223-229. *C. melitensis*, n. sp. (fossil), R. LYDEKKER, Cat. Fossil B. Brit. Mus. p. 124.

*Carpophaga chathamensis*, n. sp., Chatham Is., S. Pacific, W. ROTHSCHILD, P. Z. S. 1891, pp. 312 & 313, pl. xxviii. *C. westermanni astrolabiensis*, n. subsp., Eastern New Guinea, A. B. MEYER, Abh. zool. Mus. Dresden, 1891, No. 4, p. 14. *C. zœæ orientalis*, n. subsp., N. E. New Guinea, *id. t. c.* p. 13.

*Myristicivora spilorrhœa* : nidification ; A. J. NORTH, P. Linn. Soc. N.S.W. (2) v, pp. 880-882.

*Lithophaps*, n. g. (fossil). Type, *L. ulnaris*, n. sp., C. W. DE VIS, P. Linn. Soc. N.S.W. (2) vi, pp. 117-122.

*Leucotreron leclanchleri*, notes on ; A. B. MEYER, J. f. O. 1891, p. 73.

*Treron fulvicollis baramensis*, n. subsp., Baram, N. Borneo, *id. t. c.* pp. 42 & 73.

*Ptilopus quadrigeminus* and *P. plumbeicollis*, n. spp., Constantine Harbour, New Guinea, A. B. MEYER, Ibis, 1890, pp. 421 & 422. *P. banguueyensis*, n. sp., Banguuey I., Borneo, *id.* J. f. O. 1891, pp. 41 & 70. *P. purpureinucha*, n. sp., Basilan, *id.* t. c. pp. 42 & 71.

*Turturoena büttikoferi*, n. sp., Togoland, A. REICHENOW, J. f. O. 1891, pp. 373 & 437.

*Turtur stoliczkae*, figured ; R. B. SHARPE, Sci. Results Yark. Miss., *Aves*, pl. xiv.

*Ectopistes migratorius* on the Pacific Coast of N. America ; S. N. RHOADS, Auk, viii, pp. 310-312.

### Order OPISTHOCOMIFORMES.

PARKER, W. K. On the Morphology of a Reptilian Bird [*Opisthocomus cristatus*]. Tr. Z. S. xiii, pp. 43-86, pls. vii-x.

### Order RALLIFORMES.

*Rallus aquaticus*, figured ; LORD LILFORD, Col. Fig. Br. Birds, part xx. *R. rhythirhynchus*, figured ; E. OUSTALET, Miss. Sci. Cap Horn, Ois. pp. 131-133, pl. ii.

*Hypotaenidia striata*, egg figured ; H. E. BARNES, J. Bomb. N. H. Soc. vi, pl. to p. 129, fig. 913.

*Crex porzana*: its distribution in the British Is. ; O. V. APLIN, Zool. xlix, pp. 88-96 : in Dumfriesshire ; J. CORRIE, Tr. Dumfries Nat. Hist. Soc. 1890, p. 215 : figured ; LORD LILFORD, Col. Fig. Br. Birds, part xvii. *C. pusilla* and *C. bailloni*, figured ; *id.* op. cit. part xx.

*Porzana akool*, egg figured ; H. E. BARNES, J. Bomb. N. H. Soc. vi, pl. to p. 129, fig. 908.

*Ortygometra pusilla* : the eggs differ from those of *O. parva* ; L. KUHLMANN, J. f. O. 1891, p. 309, and E. HARTERT, t. c. p. 310.

*Gallinula chloropus*, figured ; LORD LILFORD, Col. Fig. Br. Birds, part xix. *G. galeata*, habits ; W. BREWSTER, Auk, viii, pp. 1-7.

*Gallinula (Amaurornis) coccineipes*, n. sp., Swatow, China, H. H. SLATER, Ibis, 1891, pp. 44 & 45.

*Erythra phanicura*, egg figured ; H. E. BARNES, J. Bomb. N. H. Soc. vi, pl. to p. 129, fig. 907.

*Gallixrex cristatus*, in Guzerat ; H. LITLEDAL, op. cit. v, p. 416 ; egg figured ; H. E. BARNES, op. cit. vi, pl. to p. 129, fig. 904.

*Fulica minor*, n. sp. (fossil), S.W. Oregon, R. W. SHUFELDT, Auk, viii, p. 367. *F. pisana*, n. sp. (fossil), A. PORTIS, Orn. Vald. pp. 13 & 14, tav. i, figs. 21-25.

*Ionornis martinica*, in Nova Scotia ; H. PIERS, P. N.-Scot. Inst. vii, p. 468.

*Porphyrio poliocephalus*, egg figured ; H. E. BARNES, J. Bomb. N. H. Soc. vi, pl. to p. 129, fig. 902. *P. neobritannicus*, n. sp., New Britain, A. B. MEYER, Abh. zool. Mus. Dresden, 1891, No. 4, pp. 15 & 16.

*Notornis mantelli*, notes on ; J. PARK, Tr. N. Z. Inst. xxiii, pp. 112-119.

## Order PODICIPEDIDIFORMES.

*Podiceps cristatus*, figured ; LORD LILFORD, Col. Fig. Br. Birds, part xviii. *P. minor*, figured ; *id. op. cit.* part xx.

## Order COLYMBIFORMES.

*Colymbus septentrionalis*, figured ; LORD LILFORD, Col. Fig. Br. Birds, part xviii.

*Colymboides anglicus*, n. sp. (fossil), England ; R. LYDEKKER, Cat. Fossil B. Brit. Mus. p. 192.

## Order SPHENISCIFORMES.

Notes on the family ; G. VON BIRKESSY, MT. orn. Ver. Wien, 1891, pp. 22, 23, 45, 46, 87, 88, 118, & 119.

↓ *Palaeospheniscus*, n. g. (fossil). Type, *P. antarcticus*, n. sp. (fossil) ; F. P. MORENO & A. MERCERAT, An. Mus. La Plata, i, p. 16, pl. ii, figs. 1, 2, & 4. *P. patagonicus*, n. sp. (fossil), *iid. t. c.* pp. 16 & 17, pl. i, figs. 1, 7-9, 12, 13, 15, 16, 21, 25, & 27, pl. ii, fig. 5. *P. menzibieri*, n. sp. (fossil), *iid. t. c.* pp. 17 & 18, pl. i, figs. 1, 3, 5, 6, 10, 11, 14, 17, 22, & 24, pl. ii, fig. 6. *P. bergii*, n. sp. (fossil), *iid. t. c.* pp. 18 & 19, pl. i, figs. 2, 4, 18-20, 25, & 26, pl. ii, fig. 7.

↓ *Paraptenodytes*, n. g. (fossil). Type, *Palaeospheniscus antarcticus* ; *iid. t. c.* p. 446.

## Order PROCELLARIIFORMES.

## Family DIOMEDEIDÆ.

*Diomedea regia*, n. sp., from the Auckland and Campbell Is. ; W. L. BULLER, Tr. N. Z. Inst. xxiii, pp. 234 & 235. *D. anglica*, n. sp. (fossil), England, R. LYDEKKER, Cat. Fossil B. Brit. Mus. p. 189.

## Family PROCELLARIIDÆ.

DALGLEISH, F. J. Notes on the Petrels of Madeira and adjoining Seas. P. R. Phys. Soc. Edinb. 1890-91, pp. 27-30.

*Puffinus gavia*, in New South Wales ; O. SALVIN, P. Z. S. 1891, p. 627. *P. zealandicus* [Zool. Rec. xxvii, *Aves*, p. 28] = *P. bulleri*, Salvin ; W. BULLER, Tr. N. Z. Inst. xxiii, pp. 42 & 43.

*Estrelata cervicalis*, n. sp., Kermadec Is. ; O. SALVIN, Ibis, 1891, pp. 192-194. *Æ. hesitata*, in Guadeloupe ; G. N. LAWRENCE, Auk, viii, pp. 61 & 62. *Æ. torquata* : notes on the Welsh specimen [*cf.* Zool. Rec. xxvii, *Aves*, p. 28] ; figured ; history of the species ; O. SALVIN, Ibis, 1891, pp. 411-414, pl. ix.

*Pelagodroma marina*, from Walney I. ; H. A. MACPHERSON, Ibis, pp. 602-604.

## Order ALCIFORMES.

*Alca impennis*: notes on eggs in the writer's collection; L. D'HAMONVILLE, Bull. Soc. Z. Fr. xvi, pp. 105-109: figured; LORD LILFORD, Col. Fig. Br. Birds, part xviii.

*Uria lomvia* in Connecticut; C. K. AVERILL, Auk, viii, pp. 307 & 308. *U. ausonia*, n. sp. (fossil), A. PORTIS, Orn. Vald. pp. 15-18, tav. i, figs. 28-30.

## Order LARIFORMES.

*Pseudolarus* [*potius Pseudogavia*], n. g. Type, *P. eoceanus*, n. sp. (fossil); F. P. MORENO & A. MERCERAT, An. Mus. La Plata, i, p. 446.

## Family STERCORARIIDÆ.

*Stercorarius catarrhactes* in Great Britain; H. RAEURN, Scot. Nat. 1891, pp. 18-20. In Unst; T. EDMONSTON, Ibis, 1891, pp. 633 & 634.

*Lestris parasitica* and *L. pomatorhina* in Southern Europe; E. REISER, MT. orn. Ver. Wien, 1891, pp. 53 & 54.

## Family LARIDÆ.

## Subfamily LARINÆ.

*Larus robustus* and *L. oregonus* (fossil), n. spp., S. W. Oregon; R. W. SHUFELDT, Auk, viii, p. 366. *L. canus* and *L. sabinii*, figured; LORD LILFORD, Col. Fig. Br. Birds, part xx. *L. philadelphia*, in Cornwall; J. E. HARTING, Zool. xlix, p. 35. *L. scoresbi*, figured; E. OUSTALET, Miss. Sci. Cap Horn, Ois. pp. 179-181, pl. iii.

## Subfamily STERNINÆ.

*Sternula novella*, n. sp., Mtoni, E. Africa, G. HARTLAUB, Abh. Ver. Brem. xii, p. 45.

*Sterna leucoptera* in East Africa; A. REICHENOW, J. f. O. 1891, pp. 46 & 47: in Morocco; C. A. PAYTON, Ibis, 1891, pp. 464 & 465. *S. fluviatilis*, figured; LORD LILFORD, Col. Fig. Br. Birds, part xx. *S. dougalli*, eggs figured; A. J. CAMPBELL, P. R. Soc. Vict. (n.s.) iii, pl. i, figs. 2 & 8. *S. media* and *S. bergii*, eggs figured; H. E. BARNES, J. Bomb. N. H. Soc. vi, pl. to p. 285, figs. 989 & 990.

*Sterna fuliginosa* and *Anous stolidus* lay only one egg; J. B. YOUNG, Ibis, 1891, pp. 145-147.

## Order ÆGIALITORNITHIFORMES. [INCERTÆ SEDIS.]

*Ægialornis* (*lege Ægialitornis*), n. g. (fossil). Type, *Æ. gallicus*, n. sp., France, R. LYDEKKER, Cat. Fossil B. Brit. Mus. p. 183.

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## Order CHARADRIIFORMES.

## Suborder CHARADRII.

## Family CHARADRIIDÆ.

*Squatarola cinerea*, figured; LORD LILFORD, Col. Fig. Br. Birds, part xviii.

*Charadrius dominicus* in Massachusetts; G. B. MACKAY, Auk, viii, pp. 17-24.

*Vanellus vulgaris*, figured; LORD LILFORD, Col. Fig. Br. Birds, part xix.

*Ægialitis hiaticula*: note on nesting-habits; J. E. HARTING, Zool. xlix, pp. 447-449: figured; LORD LILFORD, Col. Fig. Br. Birds, part xx.

*Æ. minutus*, egg figured; H. E. BARNES, J. Bomb. N. H. Soc. vi, pl. to p. 1, fig. 850.

## Family SCOLOPACIDÆ.

*Gallinago major*, notes on; J. ROHWEDER, J. f. O. 1891, pp. 419-426. *G. gallinula* in the Færoe Is.; H. W. FEILDEN, Zool. xlix, p. 66.

*Rhynchæa bengalensis*, egg figured; H. E. BARNES, J. Bomb. N. H. Soc. vi, pl. to p. 129, fig. 873.

*Numenius arquata*, figured; LORD LILFORD, Col. Fig. Br. Birds, part xix. *N. pliocænus*, n. sp. (fossil), A. PORTIS, Orn. Vald. pp. 13 & 14, tav. i, figs. 26a & 26b.

*Macrorhamphus griseus* in Scotland; W. E. CLARKE, Scot. Nat. 1891, p. 192, and E. HAMILTON, P. Z. S. 1891, p. 627.

*Machetes pugnax*, figured; LORD LILFORD, Col. Fig. Br. Birds, part xvii.

*Totanus glottis* and *T. calidris*, figured; *id. op. cit.*, part xviii.

*Tringa maculata* in Norfolk; E. A. BUTLER, Ibis, 1891, p. 149. *T. rufescens* and *T. minuta*, figured; LORD LILFORD, Col. Fig. Br. Birds, part xix. *T. platyrhyncha* in Norfolk; T. SOUTHWELL, Zool. xlix, p. 396.

*Himantopus candidus*, egg figured; H. E. BARNES, J. Bomb. N. H. Soc. vi, pl. to p. 129, fig. 898.

*Orymophilus fulicarius*: its migration in the Gulf of St. Lawrence; H. G. WHITE, Auk, viii, pp. 233-235.

## Suborder GLAREOLÆ.

*Glareola lactea*, egg figured; H. E. BARNES, J. Bomb. N. H. Soc. vi, pl. to p. 1, fig. 843.

## Suborder CURSORII.

*Cursorius coromandelicus*, egg figured; H. E. BARNES, J. Bomb. N. H. Soc. vi, pl. to p. 1, fig. 840.



## Suborder PARRÆ.

*Hydrophasianus chirurgus*, egg figured ; H. E. BARNES, J. Bomb. N. H. Soc. vi, pl. to p. 129, fig. 901.

*Parra indica*, egg figured ; *id. t. c.* fig. 900.

## Suborder ŒDICNEMI.

† *Milnea*, n. g. (fossil). Type, *M. gracilis*, n. sp., France ; R. LYDEKKER, Cat. Fossil B. Brit. Mus. pp. 169 & 170.

*Œdicnemus crepitans* : notes on habits ; F. M. OGILVIE, Zool. xlix, pp. 441-446.

## Suborder OTIDES.

*Otis affinis*, n. sp. (fossil), Bavaria, R. LYDEKKER, Cat. Fossil B. Brit. Mus. p. 168. *O. tarda*, in Wiltshire ; A. C. SMITH, Wilt. Mag. xxv, pp. 359-363 : in Norfolk ; J. G. TUCK, Tr. Norw. Soc. v, pp. 209-211 : in England ; J. E. HARTING, Zool. xlix, pp. 103-106. *O. dybowskii*, figured ; M. A. MENZBIER, Orn. Turkest. pl. lxiv. *O. tetraz*, in Norway ; R. COLLETT, Förh. Selsk. Chr. 1890 [1891], No. 4, pp. 10-12.

*Houbara macqueenii*, egg figured ; H. E. BARNES, J. Bomb. N. H. Soc. vi, pl. to p. 1, fig. 837.

*Choriotis australis*, notes on ; C. FRENCH, Vict. Nat. 1891, pp. 11-14.

## Order GRUIFORMES.

## Suborder GRUES.

† *Geranopsis*, n. g. (fossil). Type, *G. hastingsiae*, n. sp., England ; R. LYDEKKER, Cat. Fossil B. Brit. Mus. p. 167.

*Grus mexicana*, in South Carolina ; A. T. WAYNE, Auk, viii, pp. 308 & 309. *G. leucogeranus*, in the Hebrides ; W. E. CLARKE, Ibis, 1891, p. 635.

*Balearica gibbericeps*, n. sp., East Africa ; A. REICHENOW, Ber. Allg. Deutsch. Orn. Ges. ix, p. 4.

## Suborder RHINOCHETIDES.

BEDDARD, F. E. Contributions to the Anatomy of the Kagu (*Rhinocetus jubatus*). P. Z. S. 1891, pp. 9-21.

## Order PELARGIFORMES.

## Suborder ARDEÆ.

† *Proherodius*, n. g. (fossil). Type, *P. oweni*, n. sp. ; R. LYDEKKER, Cat. Fossil B. Brit. Mus. p. 60.

*Ardea paloccidentalis*, n. sp. (fossil), S.W. Oregon, R. W. SHUFELDT, Auk, viii, p. 367. *A. alba*, figured ; LORD LILFORD, Col. Fig. Br. Birds, part xx : in Great Britain ; J. H. GURNEY, Tr. Norw. Soc. v, pp. 186-190. *A. bubulcus*, figured ; W. E. H. PIDSLEY, B. Devon, frontisp.

*Ardetta minuta*, figured ; LORD LILFORD, Col. Fig. Br. Birds, part xix.  
*A. neozena*, in Florida ; C. B. CORY, Auk, viii, p. 309 : its nesting ;  
 W. E. D. SCOTT, *t. c.* pp. 309 & 310.

*Ardeiralla woodfordi*, note on ; W. R. OGILVIE-GRANT, Ann. & Mag.  
 Nat. Hist. (6) viii, pp. 298 & 299.

*Nycticorax violaceus*, a functional *ductus botalli* ; F. FINN, P. Z. S.  
 1891, p. 177.

#### Suborder CICONII.

↓ *Palæociconia*, n. g. (fossil) ; MORENO, Bol. Mus. La Plata, 1889, p. 30.  
 Type, *P. australis*, n. sp., *id. t. c.* p. 30. [Is a Ratite Bird ; F. AMEGHINO,  
 Rev. Arg. i, p. 445.] *P. cristata*, n. sp. (fossil), F. P. MORENO & A.  
 MERCERAT, An. Mus. La Plata, i, p. 191, pl. xix, figs. 12 & 14, pl. xx,  
 fig. 9. *P. australis*, figured ; *id. t. c.* p. 19, pl. ii, fig. 3. [*Cf. supra*,  
 p. 33.]

*Prociconia lydekkeri*, nom. emend. pro *P. australis*, Lydekker (*nec*  
 Moreno) ; F. AMEGHINO, Rev. Arg. i, p. 445.

↓ *Propelargus*, n. g. (fossil). Type, *P. edwardsi*, n. sp., Alliers ; R.  
 LYDEKKER, P. Z. S. 1891, pp. 476-479. *P. cayluxensis*, n. sp., *id.* Cat.  
 Fossil B. Brit. Mus. pp. 65 & 66.

↓ *Amphipelargus*, n. g. (fossil). Type, *A. majori*, n. sp. ; *id. t. c.* pp. 68  
 & 69.

*Ciconia nigra*, figured ; LORD LILFORD, Col. Fig. Br. Birds, part xx.

#### Suborder BALÆNICIPITEDES.

*Balæniceps rex*, popular notes on ; E. DE POUSARGUES, Le Nat. 1891,  
 pp. 203 & 204, cum fig.

#### Suborder PLATALEÆ.

↓ *Protibis*, n. g. Type, *P. cnemialis*, n. sp. (fossil), Lower Eocene of S.  
 Patagonia ; F. AMEGHINO, Rev. Arg. i, p. 445.

↓ *Ibidopsis*, n. g. (fossil). Type, *I. hordwelliensis*, n. sp. ; R. LYDEKKER,  
 Cat. B. Brit. Mus. p. 74.

*Threskiornis strictipennis* : its breeding habits ; A. J. CAMPBELL, Vict.  
 Nat. 1891, pp. 73 & 74.

### Order PHÆNICOPTERIFORMES.

*Elornis* (?) *anglicus*, n. sp. (fossil), R. LYDEKKER, Cat. Fossil B. Brit.  
 Mus. p. 80.

*Agnopteris* (?) *hantoniensis*, n. sp. (fossil), *id. t. c.* p. 96.

*Phanicopterus copei*, n. sp. (fossil), S.W. Oregon, R. W. SHUFELDT,  
 Auk, viii, p. 367.

## Order ANSERIFORMES.

*Cygnus cygnus*, in the Tirol ; L. LAZARINI, Orn. Jahrb. ii, pp. 231-233.  
*Anser hyperboreus*, in Norway ; R. COLLETT, Forh. Selsk. Chr. 1890 [1891], No. 4, pp. 12-17. *A. condoni*, n. sp. (fossil), S.W. Oregon, R. W. SHUFELDT, Auk, viii, p. 366.

*Branta propinqua*, n. sp. (fossil), S.W. Oregon, *id. t. c.* p. 367. *Bernicula brenta* and *B. leucopsis*, in Morocco ; C. A. PAYTON, Ibis, 1891, pp. 296 & 297. *Branta rufina*  $\times$  *Anas boscas* ; G. MARTORELLI, P. Z. S. 1891, p. 486.

*Chenalopeus debilis*, n. sp. (fossil), F. C. MORENO & A. MERCERAT, An. Mus. La Plata, i, p. 446.

*Tadorna casarca*, in Norway ; R. COLLETT, Forh. Selsk. Chr. 1890 [1891], No. 4, pp. 17-19 : figured ; LORD LILFORD, Col. Fig. Br. Birds, part xx.

*Spatula smithii*, nom. emend. ; E. HARTERT, Kat. Vög. Senck. Mus. p. 231, note.

*Dafila spinicauda* : a functional *ductus botalli* ; F. FINN, P. Z. S. 1891, p. 178. *D. spinicauda*  $\times$  *Aex sponsa* ; *id. t. c.* p. 330.

*Anas boscas*  $\times$  *A. strepera* ; W. L. SCLATER, P. Z. S. 1891, pp. 213 & 214. *A. boscas*  $\times$  *Mergus merganser* ; W. SCHLÜTER, Orn. Jahrb. ii, pp. 109 & 110, and V. v. TSCHUSI, *t. c.* pp. 170 & 171.

*Querquedula crecca* var. ; E. ARRIGONI DEGLI ODDI, Atti Soc. Ven. Trent. Sci. Nat. xii, pp. 142-144.

*Camptolæmus labradorus* : list of specimens in collections ; W. DUTCHER, Auk, viii, pp. 201-216, pl. ii.

*Somateria spectabilis*, in Norfolk ; T. SOUTHWELL, Tr. Norw. Soc. v, pp. 58-60.

*Micropterus cinereus* (pl. iv) distinct from *M. patagonicus* (pl. v) ; both species figured ; E. OUSTALET, Miss. Sci. Cap Horn, Ois. pp. 212-232.

*Edemia americana*, *Æ. deglandi*, and *Æ. perspicillata*, in New England ; G. H. MACKAY, Auk, viii, pp. 290-292.

*Fuligula arvernensis*, n. sp. (fossil), R. LYDEKKER, Cat. Fossil B. Brit. Mus. p. 122. *F. aretina*, n. sp. (fossil), A. PORTIS, Orn. Vald. pp. 4-9, tav. i, figs. 1-10. *F. sepulta*, n. sp. (fossil), *id. t. c.* pp. 9-13, tav. i, figs. 11-23.

*Erismatura australis* : its habits ; K. H. BENNETT, Ibis, 1891, pp. 143-145.

*Mergus albellus*, figured ; LORD LILFORD, Col. Fig. Br. Birds, part xix.

## Order PELECANIFORMES.

## Suborder PHAETHONTES.

*Phaethon rubricauda* and *P. candidus*, in Japan ; 'Key' to the species ; L. STEINER, P. U. S. Nat. Mus. xiv, pp. 492 & 493. *P. flavirostris* : description of habits in Jamaica ; W. E. D. SCOTT, Auk, viii, pp. 250-256.

## Suborder SULÆ.

*Sula bassana*, in PICARDY ; M. D'AUBUSSON, *Le Nat.* 1891, pp. 254 & 255 : on Grassholme I. ; T. H. THOMAS, *Tr. Cardiff Nat. Soc.* xxii, pt. 2, pp. 57-64.

## Suborder PHALACROCORACES.

## Family PHALACROCORACIDÆ.

† *Actiornis*, n. g. (fossil). Type, *A. anglicus*, n. sp. ; R. LYDEKKER, *Cat. Fossil B. Brit. Mus.* p. 56.

*Phalacrocorax carunculatus*, figured ; E. OUSTALET, *Miss. Sci. Cap Horn*, Ois. pp. 144-150, pl. vi. *P. gutturalis*, n. sp., Bukoba, Victoria Nyanza ; A. REICHENOW, *Ber. Allg. Deutsch. Orn. Ges.* ix, p. 5. *P. pampeanus*, n. sp. (fossil) ; F. P. MORENO & A. MERCERAT, *An. Mus. La Plata*, i, p. 19, pl. xviii, fig. 8. *P. gracula croaticus*, n. subsp., Croatia, S. BRUSINA, *Orn. Jahrb.* ii, p. 27.

## Family PLOTIDÆ.

*Plotus novæ-hollandiæ* : nidification ; A. J. NORTH, *Rec. Austr. Mus.* i, No. 7, pp. 147 & 148.

## Suborder PELECANI.

*Pelecanus fraasi*, n. sp. (fossil) ; R. LYDEKKER, *Cat. Fossil B. Brit. Mus.* pp. 44 & 45. *P. fuscus* : changes of plumage ; J. GUNDLACH, *Auk*, viii, pp. 190 & 191.

## Suborder FREGATI.

*Fregata minor* : sexual differences and breeding habits ; J. J. LISTER, *P. Z. S.* 1891, pp. 290-294, cum fig.

## STEREORNITHES, Ordo nov. (fossil†),

F. P. MORENO & A. MERCERAT, *An. Mus. La Plata*, i, p. 20.

## Family BRONTORNITHIDÆ (fossil).

[*Iid. ut suprâ.*]

† *Brontornis*, n. g. (fossil). Type, *B. burmeisteri*, n. sp., Argentina, *iid. t. c.* p. 20, pl. iii, figs. 1-4, pl. v, fig. 2. [*Cf. suprâ*, p. 32.]

† *Rostrornis*, n. g. (fossil). Type, *R. floweri*, n. sp., Argentina, *iid. t. c.* pp. 20 & 21, pl. iv, fig. 1, pl. v, figs. 1 & 3-5, pl. vi, pl. vii, figs. 1-3, pl. viii, figs. 1-3, pl. ix, fig. 1. [*Cf. suprâ*, p. 32.]

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† Referred to the *Ratite* by AMEGHINO [see p. 32].

## Family STEREORNITHIDÆ.

[*Iid. t. c. p. 21.*]

✓ *Stereornis*, n. g. (fossil). Type, *S. rollieri*; F. P. MORENO & A. MERCERAT, An. Mus. La Plata, i, p. 21, pl. ix, fig. 3, pl. x, figs. 1 & 2, pl. xi, fig. 1. *S. gaudryi*, n. sp. (fossil), *iid. t. c. p. 21*, pl. ix, fig. 4, pl. x, fig. 3. [*Vide suprâ*, p. 33.]

*Mesembriornis studei*, n. sp. (fossil), *iid. t. c. pp. 21 & 22*, pl. iv, figs. 2 & 3, pl. vii, fig. 4, pl. x, fig. 4, pl. xi, figs. 2-4, pl. xii, figs. 1-6. *M. quatre-fagei*, n. sp. (fossil), *iid. t. c. p. 22*, pl. iv, fig. 4, pl. xii, figs. 7-9, pl. xiv, fig. 1. *M. milne-edwardsi*, n. sp. (fossil), *iid. t. c. pp. 22 & 23*, pl. xiii, figs. 1-6, pl. xvi, fig. 3. [*Vide suprâ*, p. 33.]

✓ *Patagornis*, n. g. (fossil). Type, *P. marshii*, n. sp., *iid. t. c. p. 23*, pl. xiv, figs. 2-11, pl. xv, figs. 1-3. *P. lemoinei*, n. sp. (fossil), *iid. t. c. pp. 23 & 24*, pl. xv, figs. 4-6. *P. bachmanni*, n. sp. (fossil), *iid. t. c. p. 24*, pl. xv, figs. 7-10.

## Family DRYORNITHIDÆ.

[*Iid. t. c. p. 24.*]

✓ *Dryornis*, n. g. [fossil]. Type, *D. pampeanus*, n. sp.; *iid. t. c. p. 24*, pl. xvi. [*Vide suprâ*, p. 33.]

## Family DARWINORNITHIDÆ.

[*Iid. t. c. p. 24.*]

✓ *Darwinornis*, n. g. (fossil). Type, *D. copii*, n. sp. (fossil); *iid. t. c. p. 24*, pl. xvii, figs. 1 & 2. *D. zitelli*, n. sp. (fossil); *iid. t. c. p. 25*, pl. xvii, figs. 3 & 4. *D. socialis*, n. sp. (fossil); *iid. t. c. p. 25*, pl. xvii, fig. 5. [*Vide suprâ*, p. 33.]

✓ *Owenornis*, n. g. (fossil). Type, *O. affinis*, n. sp.; *iid. t. c. p. 25*, pl. xvii, fig. 6, pl. xviii, fig. 1. *O. lydekkeri*, n. sp. (fossil), *iid. t. c. p. 25*, pl. xviii, figs. 2-5. [*Vide suprâ*, p. 33.]

## Order CATHARTIDIFORMES.

*Cathartes fossilis*, n. sp., figured; F. P. MORENO & A. MERCERAT, An. Mus. La Plata, i, pl. xix, fig. 15, pl. xx, fig. 19.

*Sarcorhamphus fossilis*, n. sp., *iid. t. c. p. 27*, pl. xviii, fig. 9. [= *S. gryphus*; F. AMEGHINO, Rev. Arg. i, p. 444.]

✓ *Psilopterus*, n. g. (fossil). Type, *P. communis*, n. sp. [pl. xviii, fig. 1, pl. xxi, fig. 5]: *P. australis*, n. sp. [pl. xviii, fig. 10, pl. xx, fig. 5]: *P. intermedius*, n. sp. [pl. xx, fig. 2]; F. P. MORENO & MERCERAT, An. Mus. La Plata, i, pp. 26 & 27.

[Referred to the *Ratitæ*; F. AMEGHINO, Rev. Arg. Hist. Nat. p. 444. [*Vide suprâ*, p. 33.]

## Order ACCIPITRIFORMES.

See BOLAU, H.

GOODCHILD, J. G. Notes on Crested Birds of Prey. P. R. Soc. Edinb. x, pt. 2, pp. 202-208, pl. x.

SHUFELDT, R. W. Some comparative osteological notes on the North American Kites. *Ibis*, 1891, pp. 228-232.

## Family VULTURIDÆ.

*Gyps fulvus* in Bosnia; O. REISER, MT. orn. Ver. Wien, 1891, pp. 3 & 4.

## Family FALCONIDÆ.

## Subfamily POLYBORINÆ.

*Ibyster albigularis*, from the Gallegos River; E. OUSTALET, Miss. Sci. Cap. Horn, Ois. pp. 250 & 251.

## Subfamily ACCIPTRINÆ.

*Circus rufus* in Venezia; A. P. NINNI, Boll. Nat. 1891, No. 2, p. 15. *C. spilonotus*, figured; M. A. MENZBIER, Orn. Turkest. pl. ii a. *C. pulidus*: its migrations; E. PFANNENSCHMID, MT. orn. Ver. Wien, 1891, pp. 67 & 68.

*Accipiter granti* (Zool. Rec. xxvii, *Aves*, p. 35), figured; W. R. OGILVIE-GRANT, *Ibis*, 1890, pl. xiv.

*Astur palumbarius*, figured; LORD LILFORD, Col. Fig. Br. Birds, part xix. *A. cruentus*, egg figured; A. J. CAMPBELL, P. R. Soc. Vict. (n.s.) iii, pl. i, fig. 5. *A. brevipes*: a monograph; N. VON SSOMOW, Orn. Jahrb. ii, pp. 121-151.

*Uroszipias dampieri* and *U. etorques*, notes on; A. B. MEYER, Abh. zool. Mus. Dresden, 1891, No. 4, pp. 2 & 3.

## Subfamily BUTEONINÆ.

*Butes vulgaris* figured; LORD LILFORD, Col. Fig. Br. Birds, part xvii. *B. ferox* in the Tirol; L. LAZARINI, Orn. Jahrb. ii, pp. 229-231. *B. solitarius*, ad. et juv., figured; S. B. WILSON & A. H. EVANS, Av. Haw. pt. ii.

## Subfamily AQUILINÆ.

↓ *Tuphaetus*, n. g. (fossil). Type, *T. brachialis* (= *Uroaetus brachiulis*, Hurst, P. R. Soc. Queensl. vi, p. 261); C. W. DE VIS, P. Linn. Soc. N.S.W. (2) vi, pp. 123-125.

*Aquila pliogryps* and *A. sodalis*, n. spp. (fossil), S. W. Oregon; R. W. SHUFELDT, Auk, viii, p. 368. *A. clanga* and *A. pennata* nesting in Siebenburgen; J. V. CSATÓ, Orn. Jahrb. ii, pp. 49-53.

*Haliaetus pelagicus* and *H. branickii*, H. BOLAU, Zool. Gart. 1891, pp. 269 & 270.

## Subfamily FALCONINÆ.

*Lagopterus*, n. g. Type, *L. minutus*, n. sp. (fossil); F. P. MORENO & A. MERCERAT, An. Mus. La Plata, i, pl. xviii, fig. 7 [= *Asthenopterus*, nom. emend. pro *Lagopterus*, preocc., F. Ameghino, Rev. Arg. i, p. 443.]

*Footopterus*, n. g. (fossil), *id. t. c.* p. 26. *F. ambiguus*, n. sp. (fossil), *id. t. c.* p. 26, pl. xviii, fig. 6.

*Milvus migrans*, figured; LORD LILFORD, Col. Fig. Br. Birds, part xix.

*Pernis apivorus*, nesting in Venetia; A. P. NINNI, Boll. Soc. Nat. Napoli, 1891, No. 9, pp. 109 & 110.

*Pernis apivorus orientalis*, n. subsp., E. Siberia; L. TACZANOWSKI, Mém. Ac. Pétersb. (7) xxxix, pp. 50-52.

*Falco babylonicus* breeding in the Waziri country; D. C. PHILPOT, Ibis, 1890, pp. 467 & 468. *F. barbarus* in Malta; H. E. DRESSER, *op. cit.* 1891, p. 363. *F. aesalon*, figured; LORD LILFORD, Col. Fig. Br. Birds, part xix. *F. pisanus*, n. sp. (fossil), A. PORTIS, Orn. Vald. pp. 14 & 15, tav. i, figs. 27a & 27b.

*Hierofalco gyrfalco*, figured; R. B. SHARPE, Sci. Results Yark. Miss., Aves, pl. i: in Sussex; W. BORRER, B. of Sussex, pl. i. *H. gyrfalco* and allies in Germany; E. HARTERT, Orn. Jahrb. ii, pp. 100-103, 208, & 209. *H. islandus*, in Norway; R. COLLETT, Forh. Selsk. Chr. 1890 [1891], No. 4, pp. 7-10: in Labrador; J. A. HARVIE-BROWN, Auk, viii, p. 236.

*Falco candicans*, figured; LORD LILFORD, Col. Fig. Br. Birds, part xvii.

*Hierofalco altaicus*, n. sp., Altai Mts., M. A. MENZBIER, Orn. Turkest. p. 272.

*Gennaia saker gurneyi*, n. subsp., S.E. Russia, *id. t. c.* p.

*Hierofalco milvipes* distinct from *H. saker*; R. B. SHARPE, Sci. Results Yark. Miss., Aves, pl. ii. *H. saker*, figured; *id. t. c.* pls. xvi-xix.

*Cerchneis vespertina*: memoir by Petenyi; O. HERMAN, Lebensbild Petenyi, pp. 47-90, cum tab. *C. vespertinus*, in Roxburghshire; W. EVANS, Hist. Berwick Nat. Club, xii, pt. 2, p. 394.

*Falco cenchris*, in Ireland; A. G. MORE, Ibis, 1891, pp. 297 & 298, and Zool. xlix, p. 152: in Scilly; J. H. JENKINSON, *t. c.* p. 153. *F. dominicensis* not distinguishable from *F. sparveriioides*; R. RIDGWAY, Auk, viii, pp. 113 & 114.

## Suborder PANDIONES.

*Pandion haliaetus*: peculiar structure in the skull; R. W. SHUFELDT, Auk, viii, pp. 236 & 237.

## Order STRIGES.

See BOLAU, H., and also JACKSON, T. H.

*Scops giu*, in Scotland; G. SIM, Scot. Nat. 1891, p. 192. *S. balli*, figured; R. B. SHARPE, Sci. Results Yark. Miss., Aves, pl. xx. *S. brucei*, figured; *id. t. c.* pl. ii, and M. A. MENZBIER, Orn. Turkest. pl. viii.

*Megascops asio aikenii*, n. subsp., Colorado, W. BREWSTER, Auk, viii, pp. 139 & 140. *M. asio macfarlanei*, n. subsp., Washington Territory, *id. t. c.* pp. 140 & 141. *M. asio saturatus*, n. subsp., British Columbia, *id. t. c.* pp. 141-143. *M. vinaceus* and *M. aspersus*, figured; *id. t. c.* pl. iii, figs. 1 & 2. *M. flammeolus idahoensis*, n. subsp., Idaho; C. H. MERRIAM, N. Amer. Fauna, No. 5, p. 96, pl. i.

*Carine bactriana*, figured; R. B. SHARPE, Sci. Results Yark. Miss., Aves, pl. iii. *C. pulchra*, figured; *id. t. c.* pl. xxi.

*Heteroglaux blewitti*, figured; *id. t. c.* pl. xxii.

*Syrnium nuchale*, figured; H. BOLAU, Zool. Gart. xxxii, taf. 1.

*Glaucidium passerinum orientale*, n. subsp., E. Siberia, L. TACZANOWSKI, Mém. Ac. Pétersb. (7) xxxix, pp. 128-130.

*Ninox connivens*: nidification; A. J. NORTH, Rec. Austr. Mus. i, No. 6, p. 111.

*Speotyto*: the West Indian species of the genus; *S. cunicularia bahamensis*, n. subsp., Inagua I.; C. B. CORY, Auk, viii, pp. 348 & 349.

*Sceloglaux albifacies*, near Nelson, N. Z.; R. I. KINGSLEY, Tr. N. Z. Inst. xxiii, pp. 190 & 191.

*Nyctala tengmalmi*, in the Tatra Mountains; A. KOCYAN, Orn. Jahrb. ii, pp. 250-252.

*Nyctea scandiaca*, figured; LORD LILFORD, Col. Fig. B. Birds, part xviii.

*Surnia ulula*, in Münster; E. ALTUM, J. f. O. 1891, pp. 104-106, and E. HARTERT, *t. c.* pp. 394-396.

*Strix melitensis*, n. sp. (fossil), R. LYDEKKER, Cat. Fossil B. Brit. Mus. p. 13.

## Order CORACIIFORMES.

### Suborder CORACIÆ.

*Coracias indica*, in Lincolnshire; J. CORDEAUX, Ibis, 1891, pp. 147-149.

*Eurystomus orientalis*, notes on; H. E. DRESSER, *t. c.* pp. 99-102.

### Suborder HALCYONES.

#### Family ALCEDINIDÆ.

*Halcyon pelewensis*, n. sp., Pelew Is., L. W. WIGLESWORTH, Abh. zool. Mus. Dresden, No. 6, pp. 15 & 16.

*Sauromarptis kubaryi*, n. sp., Constantine Harbour, New Guinea, A. B. MEYER, Ibis, 1890, pp. 414 & 415. *S. gaudichaudi aruensis*, n. sp., Aru Is., *id. t. c.* p. 413.

*Tanysiptera galatea rubiensis*, n. subsp., N.W. New Guinea, *id.* Abh. zool. Mus. Dresden, 1891, No. 4, p. 8.

### Suborder BUCEROTES.

*Rhynchaceros melanoleucus*: its breeding habits in South Africa; K. WILDE, J. f. O. 1891, pp. 11-13.



*Lophoceros jacksoni*, n. sp., Suk country, C. E. Africa ; W. R. OGILVIE-GRANT, Ibis, 1891, pp. 127 & 128.

*Penelopides affinis schmackeri*, n. subsp., Mindoro, E. HARTERT, Kat. Vög. Senck. Mus. p. 139. [= *P. mindorensis*, Steere ; *id. t. c.* p. 252.]

#### Suborder UPUPÆ.

*Upupa epops* : Arabic legends ; F. DE SCHAECK, Le Nat. 1891, pp. 179 & 180. *U. somalensis*, n. sp., Somali-land, O. SALVIN, Ann. N. H. (6) vii, p. 374.

*Scoptelus notatus*, n. sp., N. E. Africa, O. SALVIN, Ann. N. H. (6) vii, p. 375.

#### Suborder MEROPES.

*Merops apiaster*, popular notes on ; A. GRANGER, Le Nat. 1891, pp. 274 & 275, cum fig. *M. salvadorii*, n. sp., New Britain, A. B. MEYER, Ibis, 1891, pp. 293 & 294.

#### Suborder CAPRIMULGI.

*Caprimulgus europæus*, notes on ; J. H. GURNEY, Tr. Norw. Soc. v, pp. 73-79.

*Antrostomus rufomaculatus*, n. sp., Costa Rica, R. RIDGWAY, P. U. S. Nat. Mus. xiv, pp. 465 & 466.

*Otophanes mcleodii*, figured ; W. BREWSTER, Auk, viii, pl. iv.

#### Suborder CYPSELI.

*Cypselus melba*, notes on ; E. PERZINA, MT. orn. Ver. Wien, 1891, pp. 203-210, 220, 221, 227, 228, 243, & 244 ; ZEHNTNER, Arch. f. Nat. lxi, pp. 189-220, taf. xi. *C. apus* in Herefordshire, its habits, &c. ; AUBREY EDWARDS, Nat. Notes, 1891, pp. 10-13, 27-30, 50-53, 67-69, 91, & 92.

*Cypseloides niger* in California ; W. E. BRYANT, Zoe, ii, p. 128.

*Collocalia francica*, from Panay and other Philippine Islands, is probably *C. cebuensis*, Kutter ; E. HARTERT, J. f. O. 1891, p. 302.

*Chætura dominica colardeaui*, n. subsp., Guadeloupe, W. Indies ; G. N. LAWRENCE, Auk, viii, pp. 59-61.

#### Suborder TROCHILI.

See LUCAS, F. A.

*Phaethornis gounellei*, n. sp., Brazil, A. BOUCARD, Humming B. i, p. 17. *P. columbianus*, n. sp., Colombia, *id. t. c.* p. 17. *P. guianensis*, n. sp., Demerara, *id. t. c.* p. 17. *P. whitelyi*, n. sp., Roraima, *id. t. c.* p. 18.

*Aphantochroa alexandri*, n. sp., Demerara, *id. t. c.* p. 18.

*Eustephanus burtoni*, n. sp., Chili, *id. t. c.* p. 18.

*Florisuga sallæi*, n. sp., S. Mexico, *id. t. c.* p. 18.

*Lampornis obscura*, n. sp., Brazil, *id. t. c.* p. 25.

*Lafresuaya cinereorufa*, n. sp., Colombia, *id. t. c.* p. 25.

- Helianthus henrici*, n. sp., Ecuador, A. BOUCARD, Humming B. i, p. 26.  
*Bellona superba*, n. sp., St. Vincent, *id. t. c.* p. 43.  
*Lesbia boliviana*, n. sp., Bolivia, *id. t. c.* p. 43.  
*Hylocharis guianensis*, n. sp., British Guiana, *id. t. c.* p. 52.  
*Calliphlox roraimæ*, n. sp., Roraima, *id. t. c.* p. 52.  
*Selasphorus rubromitratus*, nom. emend. pro *S. floresii*, Gould (*nec Trochilus floresii*, Bourcier); R. RIDGWAY, Auk, viii, p. 114.  
*Orthorynchus boothi* in Cuba, notes on; J. GUNDLACH, Auk, viii, pp. 187 & 188.  
*Panychlora micans*, n. sp., Hab. ?, O. SALVIN, Ann. N. H. (6) vii, p. 375.  
*Amazilia sumichrasti*, n. sp., Tehuantepec, S. Mexico, *id. t. c.* p. 376.  
*Helianthus laticlavus* and *H. violicollis*, n. spp., Ecuador, *id. t. c.* p. 376.  
*Heliotrypha speciosa*, n. sp., Colombia ?, *id. t. c.* p. 376.  
*Phæolama cervinigularis*, n. sp., Ecuador ?, *id. t. c.* p. 377.  
*Oreopyra pectoralis*, n. sp., Costa Rica, *id. t. c.* p. 377.  
*Polyerata decora*, n. sp., Chiriqui, *id. t. c.* p. 377.  
*Eriocnemis ventralis*, n. sp., Colombia, *id. t. c.* p. 378.

### Order TROGONES.

- Pharomacrus resplendens*: popular notes; A. GRANGER, Le Nat. 1891, pp. 162 & 163, cum figs.  
*Trogon (Calurus) hargitti*, n. sp., Venezuela, E. OUSTALET, *t. c.* p. 261.  
*T. massena*, notes on; R. RIDGWAY, P. U. S. Nat. Mus. xiv, pp. 476-478.

### Order COCCYGES.

- SHELLEY, G. E. Catalogue of the *Picariæ* in the Collection of the British Museum. [Vol. xix of The Catalogue of Birds.] *Cuculidæ*, *Musophagidæ*, pp. 209-456, pls. xi-xiii.

### Family CUCULIDÆ.

- Cuculus canorus*: its history, as given by Aldrovandus (1610). H. FREIFRAU VON ULM-ERBACH, MT. orn. Ver. Wien, 1891, pp. 206, 207, 216-219, 227, & 228: figured; LORD LILFORD, Col. Fig. Br. Birds, part xviii: habits of young; W. H. TUCK, Ibis, 1890, pp. 466 & 467: eggs; T. L. KUHLMANN, J. f. O. 1891, p. 309; E. HARTERT, *t. c.* p. 310; R. B. SHARPE, *t. c.* p. 310.

- Coccyzus hypopinnarius* (fig. 2) and *C. caroli* (fig. 1), figured; G. E. SHELLEY, Cat. B. Brit. Mus. xix, pl. xi.

- Coccyzus minor* (fig. 2), *C. maynardi* (fig. 3), and *C. dominicæ* (fig. 1): heads figured; *id. ibid.* pl. xii. *C. lindeni*, Allen, is *C. euleri*, Cab.; F. M. CHAPMAN, Auk, viii, p. 159.

<sup>1</sup> *Urococcyx*, n. g. Type, *U. erythronathus* (Hartl.); G. E. SHELLEY, Cat. B. Brit. Mus. xix, p. 398.

*Cercococcyx mehowi*, from Togoland; A. REICHENOW, J. f. O. 1891, pp. 377 & 378.

*Centropus purpureus*, n. sp., Sumatra, G. E. SHELLEY, Cat. B. Brit. Mus. xix, p. 348, pl. xiii.

*Crotophaga ani*, in Florida; A. S. PACKARD, Auk, viii, p. 313: in Arizona; O. C. POLING, t. c. pp. 313 & 314.

### Family MUSOPHAGIDÆ.

See SHELLEY, G. E.

*Corythaix schalowi*, n. sp., Benguela: notes on and synonymy of the species and *C. livingstoni*; A. REICHENOW, J. f. O. 1891, pp. 147-149 & 210.

*Turacus persa bültneri*, n. subsp., Togoland, *id.* t. c. pp. 375 & 376.

### Order PSITTACIFORMES.

RAMSAY, E. P. Catalogue of the Australian Birds in the Australian Museum at Sydney, N.S.W. Part III. *Psittaci*. 1891, 8vo, pp. 1-106.

*Platycercus pennanti*, n. var. *nigrescens*, Queensland, *id.* t. c. p. 52.

SALVADORI, T. Catalogue of the *Psittaci*, or Parrots, in the Collection of the British Museum. [Vol. xx of The Catalogue of Birds.] 1891, pp. i-xvii & 1-658, pls. i-xviii.

### Family NESTORIDÆ.

*Nestor notabilis*: notes on; F. F. C. HUDDLESTON, N. Z. J. Sci. (2) i, pp. 198-201.

### Family LORIIDÆ.

*Eos challengerii*, n. sp., Meangis I., T. SALVADORI, Cat. B. Brit. Mus. xix, p. 22.

*Lorius salvadorii*, n. sp., Astrolabe Bay, New Guinea, A. B. MEYER, Abh. zool. Mus. Dresden, 1891, No. 4, p. 6.

<sup>1</sup> *Hypocharmosyna*, n. g. Type, *H. placens* (Temm.); T. SALVADORI, Cat. B. Brit. Mus. xx, p. 72.

*Neopsittacus rubripileum*, n. sp., Timor, *id.* t. c. p. 88.

### Family CYCLOPSITTACIDÆ.

*Cyclopsittacus nigrifrons*, n. sp., N.W. New Guinea; A. REICHENOW, J. f. O. 1891, pp. 217 & 218. *C. amabilis*, n. sp., N.W. New Guinea, *id.* t. c. p. 432.

## Family PSITTACIDÆ.

## Subfamily NASITERNINÆ.

*Nasiterna nanina*, n. sp., Bugoto, Solomon Is.; H. B. TRISTRAM, Ibis, 1891, p. 608.

## Subfamily CONURINÆ.

*Sittace caninde*: head figured; A. REICHENOW, J. f. O. 1891, taf. i, fig. 1.

*Conurus callogenys*, n. sp., Ecuador, T. SALVADORI, Cat. B. Brit. Mus. xx, p. 188.

*Conuropsis*, n. g. Type, *C. carolinensis*; *id. t. c.* p. 203: its past and present distribution; E. M. HASBROUCK, Auk, viii, pp. 369-379, with map (pl. vi).

*Pyrrhura emma*, n. sp., Venezuela, T. SALVADORI, Cat. B. Brit. Mus. xx, p. 217, pl. i. *P. berlepschi*, n. sp., Peruvian Amazons, *id. t. c.* p. 224, pl. ii, fig. 1. *P. rupicola* figured; *id. t. c.* pl. ii, fig. 2. *P. rhodocephala*, figured; *id. t. c.* pl. iii.

*Myiopsittacus luchi*, figured; *id. t. c.* pl. iv.

*Bolborhynchus andicola*, figured; *id. t. c.* pl. v.

*Psittacula sclateri*, figured; *id. t. c.* pl. vi. *P. flavesceus*, n. sp., Bolivia, *id. t. c.* p. 248.

## Subfamily PIONINÆ.

*Chrysotis virenticeps*, n. sp., Costa Rica, T. SALVADORI, Cat. B. Brit. Mus. xx, p. 280. *C. diademata* (fig. 2), *C. salvini* (fig. 3), *C. lilacina* (fig. 1): heads figured; *id. t. c.* pl. vii. *C. chloronota*, figured; *id. t. c.* pl. viii. *C. brasiliensis*, its synonymy; H. VON BERLEPSCH, J. f. O. 1891, pp. 363-366. *C. leucocephala*: variations; J. GUNDLACH, Auk, viii, pp. 188 & 189.

*Androglossa hecki*, n. sp., Colombia, A. REICHENOW, J. f. O. 1891, p. 217, taf. i, fig. 2.

*Pionus bridgesi*, n. sp., Bolivia and Argentina, A. BOUCARD, Humming B. i, p. 26.

*Pionopsittacus pyrrhops*, figured; T. SALVADORI, Cat. B. Brit. Mus. xx, pl. ix.

*Pæocephalus fuscicapillus* in Mssua, E. Africa; A. REICHENOW, J. f. O. 1891, p. 145.

## Subfamily PSITTACINÆ.

*Psittacus erythacus megarhynchus*, n. subsp., W. Africa, E. HARTERT, Kat. Vög. Senck. Mus. p. 157, note.

## Subfamily PALÆORNITHINÆ.

*Geoffroyius orientalis*, n. sp., E. New Guinea, A. B. MEYER, Abh. zool. Mus. Dresden, 1891, No. 4, pp. 4 & 5. *G. floresianus*, n. sp., Flores, T. SALVADORI, Cat. B. Brit. Mus. xx, p. 406. *G. sumbavensis*, n. sp., Sumbawa, *id. t. c.* p. 407.

*Tanygnathus everetti*, figured, T. SALVADORI, Cat. B. Brit. Mus. xx, pl. x. *T. burbidgii*, figured, *id. t. c.* pl. xi.

*Palæornis finschi*, figured; *id. t. c.* pl. xii.

*Polytelis alexandræ*, from Charlotte Waters, S. Australia; P. L. SCLATER, Ibis, 1891, pp. 298 & 299: note on; M. SYMONDS CLARK, Vict. Nat. 1891, pp. 90 & 91.

*Ptistes wetterensis*, n. sp., Wetter L., T. SALVADORI, Cat. B. Brit. Mus. xx, p. 484.

†*Bolbopsittacus*, n. g. Type, *B. lunulatus*; *id. t. c.* p. 503. *B. intermedius*, n. sp., Philippines, *id. t. c.* p. 505, pl. xiii.

*Loriculus bonapartei*, figured; *id. Ibis*, 1891, pp. 48-51, pl. iii. *L. quadricolor*, figured; *id. Cat. B. Brit. Mus.* xx, pl. xv. *L. amabilis*, figured; *id. t. c.* pl. xiv.

#### Subfamily PLATYCERCINÆ.

*Platycercus auriceps*, var.; R. J. KINGSLEY, Tr. N. Z. Inst. xxiii, p. 192. *P. xanthogenys* figured; T. SALVADORI, Cat. B. Brit. Mus. xx, pl. xvi. *P. erythropeplus*, n. sp., S. Australia, *id. P. Z. S.* 1891, p. 130, pl. xii. *P. xanthogenys*, n. sp., Australia, *id. t. c.* p. 129.

*Psephotus xanthorrhous*, n. var. *pallescens*, Australia; *id. Cat. B. Brit. Mus.* xx, p. 563.

↓*Neophema*, n. g. Type, *N. pulchella*; *id. t. c.* p. 569.

*Cyanorhamphus subflavescens*, n. sp., from Lord Howe Is., *id. Ann. N. H.* (6) vii, p. 64: figured; *id. Cat. B. Brit. Mus.* xx, pl. xvii. *C. cyanurus*, n. sp., Raoul I., *id. Ann. N. H.* (6) vii, p. 64: figured; *id. Cat. B. Brit. Mus.* xx, pl. xviii.

#### Family STRINGOPIDÆ.

*Stringops habroptilus*, notes on; J. PARK, Tr. N. Z. Inst. xxiii, pp. 112-119.

### Order SCANSORES.

#### Suborder RHAMPHASTIDES.

SCLATER, P. L. Catalogue of the *Picariæ* in the Collection of the British Museum. [Vol. xix of The Catalogue of Birds.] *Rhamphastidæ*, pp. 122-161, pls. vi-x.

*Pteroglossus didymus* (pl. vi), *Aulacorhamphus erythronathus* (pl. vii), *A. calorhynchus* (pl. viii), *A. whiteleyanus* (pl. ix), and *A. cyanolemus* (pl. x), figured; *id. ut supra*.

#### Suborder CAPITONES.

SHELLEY, G. E. Catalogue of the *Picariæ* in the Collection of the British Museum. [Vol. xix of The Catalogue of Birds.] *Capitonidæ*, pp. 13-121, pls. i-v.

*Melanobucco æquatorialis*, figured ; G. E. SHELLEY, Cat. B. Brit. Mus. xix, pl. i. *Tricholema stigmatothorax* (fig. 1) and *T. affine* (fig. 2), figured ; *id. t. c.* pl. ii.

*Capito richardseni* (fig. 3), *C. granadensis*, n. sp. (fig. 5), New Granada, *C. steerii* (fig. 2), *C. versicolor* (fig. 1), *C. bourcierii* (fig. 6), *C. salvini*, n. sp. (fig. 4), Panama ; *id. t. c.* pl. v.

*Megalæma*: structure of heel similar to that of *Jynx* ; T. SALVADORI, *Ibis*, 1891, pp. 149 & 150.

*Cyanops incognita*, figured ; R. B. SHARPE, Sci. Results Yark. Miss. Aves, pl. xxiv. *C. davisoni* (fig. 1), *C. incognita* (fig. 3), and *C. ramsayi* (fig. 2) : heads figured ; G. E. SHELLEY, Cat. B. Brit. Mus. xix, pl. iv.

*Xantholema intermedia*, n. sp., Philippines, *id. t. c.* p. 97.

*Trachylæmus*, n. subg. Type, *T. purpuratus* ; A. REICHENOW, Ber. Allg. Deutsch. Orn. Ges. ix, p. 3. *T. togoensis*, n. sp., Togoland, *id. t. c.* p. 3.

*Trachyphonus emini*, n. sp., Mpapwa, E. Africa, *id. J. f. O.* 1891, pp. 149 & 150. *T. elgonensis*, n. sp., Mt. Elgon, E. Africa ; R. B. SHARPE, *Ibis*, 1891, p. 122.

*Gymnobucco cinereiceps*, n. sp., Mt. Elgon, E. Africa, *id. t. c.* p. 122.

*Barbatula bilineata* (fig. 2) and *B. chrysopyga* (fig. 1), figured ; G. E. SHELLEY, Cat. B. Brit. Mus. xix, pl. iii.

#### Suborder INDICATOIRES.

SHELLEY, G. E. Catalogue of the *Picariæ* in the Collection of the British Museum. [Vol. xix of The Catalogue of Birds.] *Indicatoridæ*, pp. 1-12.

*Indicator emini*, Shelley, = *Prodotiscus insignis* (Cass.) ; *id. t. c.* p. 12. *I. boehmei*, n. sp., E. Africa, A. REICHENOW, J. f. O. 1891, p. 39. *I. pygmaeus*, n. sp., Bukoba, Victoria Nyanza, *id. Ber. Allg. Deutsch. Orn. Ges.* ix, p. 4.

#### Order PICIFORMES.

##### Suborder PICI.

SHUFELDT, R. W. On the question of Saurognathism of the *Pici*, and other Osteological Notes upon that Group. P. Z. S. 1891, pp. 122-129.

##### Family PICIDÆ.

##### Subfamily PICINÆ.

*Colaptes auratus*: changes of the pattern in the upper tail-coverts ; F. M. CHAPMAN, Bull. Am. Mus. Nat. Hist. iii, pp. 311-314.

*Dendrocopos leucopterus*, figured ; R. B. SHARPE, Sci. Results Yark. Miss., Aves, pls. xii & xiii.

*Sphyrapicus varius*, its habits and food ; F. BOLLES, Auk, viii, pp. 256-270.

*Campephilus principalis* : its present range, with a map of its present and past distribution ; E. M. HASBROUCK, Auk, viii, pp. 174-186.

*Celeus kerri*, n. sp., River Pilcomayo, E. HARGITT, Ibis, 1891, pp. 605 & 606.

#### Subfamily IYNGINÆ.

*Iynx torquilla* : tuberculated heel in young ; A. GÜNTHER, Ibis, 1890, pp. 411 & 412, cum fig.

#### Subfamily PICUMNINÆ.

*Picumnus pilcomayoensis*, n. sp., River Pilcomayo, F. HARGITT, Ibis, 1891, pp. 606 & 607.

#### Suborder GALBULÆ.

SCLATER, P. L. Catalogue of the *Picariæ* in the Collection of the British Museum. [Vol. xix of The Catalogue of Birds.] *Galbulidæ*, pp. 161-177.

*Brachygalba fulviventris*, n. sp., Colombia, *id. t. c.* p. 172.

#### Suborder BUCCONES.

SCLATER, P. L. Catalogue of the *Picariæ* in the Collection of the British Museum. [Vol. xix of The Catalogue of Birds.] *Buconidæ*, pp. 178-208.

*M. panamensis* and its races : *a*, var. *costaricensis* ; *b*, var. *typica* ; *c*, var. *mystacalis* ; *d*, var. *æquatorialis* ; *id. t. c.* pp. 196 & 197.

### Order PASSERIFORMES.

#### Section A. OSCINES.

#### Family CORVIDÆ.

STONE, W. Catalogue of the *Corvidæ* in the Collection of the Academy of Natural Sciences of Philadelphia. P. Ac. Philad. 1891, pp. 441-447.

DOD, F. H. WOLLEY. *Corvus frugilegus* and *C. corone*. Notes on habits. 21st Ann. Rep. Well. Soc. pp. 16-34.

*Corvus frugilegus* : the acquisition of the naked face ; R. C. OUDEMANS, Zool. Gart. xxxii, pp. 123-125.

*Corvus annectens*, n. sp. (fossil), S.W. Oregon, R. W. SHUFELDT, Auk, viii, p. 368.

*Nucifraga caryocatactes*, figured ; W. BORRER, B. Sussex, pl. iv : in Wigtownshire ; H. MAXWELL, Scot. Nat. 1891, p. 191.

*Cyanocorax heilprini*, Gentry, probably a hybrid between *C. cyanomelas* and *C. cyanopogon* ; W. STONE, P. Ac. Philad. 1891, p. 443.

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*Garrulus leucotis* figured ; R. B. SHARPE, Sci. Results Yark. Miss., Aves, pl. xxiii.

*Psilorhinus* : notes on the genus ; W. STONE, P. Ac. Philad. 1891, pp. 94-96.

*Strepera plumbea*, eggs figured ; A. J. CAMPBELL, P. R. Soc. Vict. (n.s.) iii, pl. i, figs. 7 & 9.

*Podoces* : remarks on the species ; A. REICHENOW, J. f. O. 1891, p. 211. *P. panderi* : in confinement ; A. WILKINS, Nature, xlv, p. 151. *P. bidulphi*, figured ; R. B. SHARPE, Sci. Results Yark. Miss., Aves, pl. iv.

### Family PARADISEIDÆ.

Notes on the Cubital Coverts in the family ; L. STEJNEGER, P. U. S. Nat. Mus. xiv, pp. 499 & 500.

SHARPE, R. B. Monograph of the *Paradiseidæ*, or Birds of Paradise, and *Ptilonorhynchidæ* [q.v.], or Bower-Birds. Part i, folio, 1891.

The following species are figured : *Lycocorax pyrrhopterus*, *Parotia lawesi*, *Cicinnurus regius*, *Craspedophora magnifica*, *Epimachus meyeri*, *Paradisea apoda*, *Xanthomelus aureus*.

STONE, W. Catalogue of the *Paradiseidæ* in the Collection of the Academy of Natural Sciences. P. Ac. Philad. 1891, pp. 448 & 449.

### Subfamily PARADISEINÆ.

*Semioptera gouldi*, n. sp., Moluccas, A. BOUCARD, Humming B. i, pp. 43 & 44.

*Craspedophora mantoni*, n. sp., patria ign., E. OUSTALET, Le Nat. 1891, pp. 260 & 261.

### Subfamily EPIMACHINÆ.

*Epimachus ellioti* described ; A. B. MEYER, Ibis, 1890, p. 418.

↓ *Paryphephorus*, n. g. Type, *Craspedophora duivenbodei*, n. sp., New Guinea ; *id. t. c.* pp. 419 & 420, pl. xii.

*Manucodia comrii* : the trachea figured ; F. E. BEDDARD, Ibis, 1891, pp. 512-514.

### Family PTILONORHYNCHIDÆ.

SHARPE, R. B. Monograph of the *Paradiseidæ* [q.v.], or Birds of Paradise, and *Ptilonorhynchidæ*, or Bower-Birds. Part i, folio, 1891.

The species figured are : *Prionodura newtoniana*, *Ohlamydodera orientalis*, *Tectonornis* (nom. emend. pro *Scenopæus*, Ramsay) ; *id.* Monogr. Parad. Part i. [= *Scenopæstes*, Coues, *infra*.]

STEJNEGER, L. Notes on the Cubital Coverts in the Family. P. U. S. Nat. Mus. xiv, pp. 499 & 500.

*Ohlamydodera nuchalis* : notes on habits ; W. BURTON, Humming B. i, pp. 53 & 54.



*Alurædus viridis*: nest and egg figured; A. J. NORTH, Rec. Austral. Mus. i, No. 6, pls. xii & xiii.

*Æluroedus geislerorum*, n. sp., Eastern New Guinea; A. B. MEYER, Abh. zool. Mus. Dresden, 1891, p. 12.

↓ *Scenopætes*, nom. emend. pro *Scenopæus*, Ramsay, 1875, pre-occupied by *Scenopæus*, Agassiz, in 1847, E. COUES, Auk, viii, p. 115.

*Cnemophilus macgregori* [cf. Zool. Rec. xxvii, Aves, p. 44], figured; P. L. SCLATER, Ibis, 1891, p. 179, pl. x.

### Family STURNIDÆ.

*Sturnus vulgaris* and its allies; R. B. SHARPE, J. f. O. 1891, pp. 307 & 308: notes on nesting; H. H. SLATER, Naturalist, 1891, pp. 143 & 144.

### Family EULABETIDÆ.

↓ *Galeopsar*, n. g. Type, *G. salvadorii*, n. sp., Suk, E. C. Africa; R. B. SHARPE, Ibis, 1891, pp. 241 & 242, pl. iv.

*Amydrus elgonensis*, n. sp., Mt. Elgon, E. Africa, *id. t. c.* p. 242.

↓ *Kittlitzia*, n. g. Type, *K. corvina* (Kittl.); E. HARTERT, Kat. Vög. Mus. Senck. p. 75, note.

*Laurillardia*, n. gen. Types, *L. parisiensis* and *L. munieri*, n. spp. (fossil); M. PLOT, Mém. Soc. Geol. France, Palæont., pp. 1-10, pl. xviii. 7/

### Family ORIOLIDÆ.

STONE, W. Catalogue of the *Oriolidæ* in the Collection of the Academy of Natural Sciences. P. Ac. Philad. 1891, pp. 449 & 450.

*Oriolus galbula* in Norway; R. COLLETT, Forh. Selsk. Chr. 1890 [1891], No. 4, pp. 5 & 6.

*Sphecotheres maxillaris*: nest and eggs figured; A. J. NORTH, Rec. Austral. Mus. i, No. 6, pl. xiv.

### Family ICTERIDÆ.

*Quiscalus nicaraguensis*, n. sp., Lake Managua, Nicaragua, O. SALVIN & F. D. GODMAN, Ibis, 1891, p. 612.

*Scolecophagus affinis*, n. sp. (fossil), S.W. Oregon, R. W. SHUFELDT, Auk, viii, p. 368.

*Icterus northropi*, figured; J. I. NORTHROP, *t. c.* pl. i.

*Molothrus bonariensis* and its allies; W. STONE, *t. c.* pp. 344-347. *M. venezuelensis*, n. sp., Venezuela, *id. t. c.* p. 347.

### Family PLOCEIDÆ.

*Penthetria asymmetrura*, n. sp., S.W. Africa, A. REICHENOW, Ber. Allg. Deutsch. Orn. Ges. ix, p. 4.

↓ *Drepanoptes*, n. g. Type, *D. jacksoni*, n. sp., Kikuyu, E. C. Africa, R. B. SHARPE, Ibis, 1891, pp. 246 & 247, pl. v.

*Spermestes stigmatophorus*, n. sp., Bukoba, Victoria Nyanza, A. REICHENOW, Ber. Allg. Deutsch. Orn. Ges. ix, p. 4.

*Munia sharpii* = *M. capistrata*, Hartl. ; G. HARTLAUB, Ibis, 1891, p. 298.

*Poephila mirabilis*, breeding in confinement ; F. E. BLAAUW, P. Z. S. 1891, pp. 465 & 466.

#### Subfamily PLOCEINÆ.

*Heterhyphantes stephanophorus*, n. sp., Mau, E. Africa, R. B. SHARPE, Ibis, 1891, p. 117 : figured, t. c. pl. vi, fig. 2.

*Symplectes mentalis*, n. sp., Buguera, E. Africa, G. HARTLAUB, J. f. O. 1891, p. 315.

*Sycobrotus insignis*, n. sp., Mt. Elgon, E. Africa, R. B. SHARPE, Ibis, 1891, p. 117 : figured, t. c. pl. v, fig. 1.

*Ploceus holoxanthus*, n. sp., Mtoni, E. Africa, G. HARTLAUB, Abh. Ver. Brem. xii, pp. 22 & 23.

*Nigrita schistacea*, n. sp., Sotik, E. Africa, R. B. SHARPE, Ibis, 1891, p. 118. *N. emini*, n. sp., Ugogo, A. REICHENOW, J. f. O. 1891, p. 159. *N. sparsim guttata*, n. sp., Bukoba, Victoria Nyanza, *id.* Ber. Allg. Deutsch. Orn. Ges. ix, p. 4.

#### Family TANAGRIDÆ.

Remarks on various Costa Rican species ; G. K. CHERRIE, P. U. S. Nat. Mus. xiv, pp. 530-532.

*Procnias tersa*, in Argentina ; P. L. SCLATER, Ibis, 1891, p. 17.

*Arremon aurantirostris saturatus*, n. subsp., Costa Rica, G. K. CHERRIE, P. U. S. Nat. Mus. xiv, pp. 343-345.

*Calliste margaritæ*, n. sp., Matto-Grosso, Brazil, J. A. ALLEN, Bull. Am. Mus. Nat. Hist. iii, art. xxiv, pp. 351-354.

*Rhamphocelus chrysopterus*, n. sp., Panama, A. BOUCARD, Humming B. i, p. 53. *R. costaricensis*, n. sp., Costa Rica, G. K. CHERRIE, Auk, viii, pp. 62-64.

*Spindalis zena stejnegeri*, n. subsp., Eleuthera I., Bahamas, C. B. CORY, t. c. p. 348.

#### Family CÆREBIDÆ.

CORY, C. B. On the West Indian species of the genus *Certhiola* or *Cæreba*. Auk, viii, pp. 37-41.

A monographic sketch, with synonymy.

*Cæreba cyanea* changing from the green winter plumage to the full plumage every year without a moult ; A. REICHENOW, J. f. O. 1891, p. 219.

#### Family DREPANIDIDÆ.

*Drepanis pacifica*, figured ; S. B. WILSON & A. H. EVANS, Av. Haw. pt. ii : its systematic position ; H. GADOW, t. c. pp. 10-12.

*Himatione sanguinea*, figured ; S. B. WILSON & A. H. EVANS, Av. Haw. pt. ii: its anatomy, *t. c.* p. 13, figs. 40 & 41. *H. dolei*, n. sp., Main I., S. B. WILSON, P. Z. S. 1891, pp. 166 & 167. *H. mana*, n. sp., Hawaii, *id.* Ann. N. H. (6) vii, p. 460.

*Loxops coccinea* : its anatomy ; H. GADOW, *t. c.* pp. 13 & 14.

*Vestiaria coccinea* : its anatomy ; *id.* *t. c.* pp. 12 & 13, pl. iii, figs. 36-39.

*Oreomyza bairdi*, figured ; S. B. WILSON & A. H. EVANS, Av. Haw. pt. ii : its anatomy ; H. GADOW, *t. c.* p. 15, pl. iii, figs. 49-54.

*Chrysomitridops* is allied to *Loxops* and *Oreomyza* ; *id.* *t. c.* p. 15.

*Hemignathus procerus* and *H. olivaceus* : their anatomy ; *id.* *t. c.* p. 15, pl. iii, figs. 42-48.

### Family FRINGILLIDÆ.

#### Subfamily COCCOTHAUSTINÆ.

*Pheucticus aurantiacus*, n. sp., Volcan de Santa Maria, Guatemala, O. SALVIN & F. D. GODMAN, Ibis, 1891, p. 272.

*Spermophila richardsoni*, n. sp., Chiapas and Guatemala, *id.* *t. c.* pp. 611 & 612.

*Cardinalis cardinalis canicaudus*, n. subsp., Texas, F. M. CHAPMAN, Bull. Am. Mus. Nat. Hist. iii, pp. 323-326.

#### Subfamily FRINGILLINÆ.

*Fringilla maderensis* and its allies ; W. R. OGILVIE-GRANT, Ibis, 1890, pp. 441 & 442. *F. linaria* in Ireland ; H. SEEBOHM, Ibis, 1891, p. 587.

*Montifringilla alpicola*, in Yarkand ; R. B. SHARPE, Sci. Results Yark. Miss., Aves, p. 31.

*Rhodopechys sanguinea*, figured ; *id.* *t. c.* pl. v.

*Passer domesticus*, in New Zealand ; T. W. KIRK, Tr. N. Z. Inst. xxiii, pp. 108-110, and N. Z. J. Sci. (2) i, pp. 9-12.

*Passer shelleyi*, n. sp., Lado, Equat. Africa, R. B. SHARPE, Ibis, 1891, pp. 256 & 257.

*Poliospiza striatipectus*, n. sp., Elgeyo, E. Africa, *id.* *t. c.* pp. 258 & 259.

*Crithagra albifrons*, n. sp., Kikuyu, E. Africa, *id.* *t. c.* p. 118.

*Carpodacus stoliczkae*, figured ; *id.* Sci. Results Yark. Miss., Aves, pl. vi.

*Loxia curvirostra*, figured ; LORD LILFORD, Col. Fig. Br. Birds, part xvii. *L. bifasciata*, figured ; *id.* *op. cit.* part xix.

*Pinicola enucleator*, in Notts ; F. B. WHITLOCK, Naturalist, 1891, p. 38.

*Loxioides bailleui*, its anatomy ; H. GADOW, in Wilson & Evans, Av. Haw. pt. ii, pp. 5 & 6, pl. i, figs. 11-16.

*Psittirostra psittacea*, figured ; S. B. WILSON & A. H. EVANS, *op. cit.* pt. ii : its anatomy ; H. GADOW, *t. c.* pp. 6 & 7, pl. i, figs. 21-35.

#### Subfamily EMBERIZINÆ.

*Emberiza aureola*, in Holland ; F. E. BLAAUW, Ibis, 1891, p. 151. *E. janskowskii*, n. sp., Sidemi, E. Siberia ; L. TACZANOWSKI, Mém. Ac. Pétersb. (7) xxxix, pp. 587 & 588. *E. lapponica* and *Plectrophanes nivalis*, figured ; LORD LILFORD, Col. Fig. Br. Birds, part xvii.

*Zonotrichia capensis* and its allies, *Z. capensis chilensis* and *Z. capensis costaricensis*, n. subsp., Costa Rica; J. A. ALLEN, Bull. Am. Mus. Nat. Hist. iii, art. xxiv, pp. 372-374.

*Junco carolinensis* is only subspecifically distinct from *J. hyemalis*; J. DWIGHT, Auk, viii, pp. 290-292. *J. hyemalis thurberi*, probably identical with *J. h. schufeldti*; F. M. CHAPMAN, Auk, viii, pp. 115 & 116.

*Spizella pusilla arenacea*, in Louisiana; F. M. CHAPMAN, Auk, viii, p. 318.

*Ammodramus henslowi occidentalis*, n. subsp., Dakota, W. BREWSTER, t. c. pp. 145 & 146. *A. caudacutus becki*, n. subsp., California, R. RIDGWAY, P. U. S. Nat. Mus. xiv, pp. 483 & 484.

*Passerella iliaca unalaschensis*: its nesting habits; H. R. TAYLOR, Zoe, ii, p. 123.

*Pipilo maculatus magnirostris*, n. subsp., Lower California; W. BREWSTER, Auk, viii, pp. 146 & 147.

*Pseudochloris lebruni*, n. sp., Patagonia, E. OUSTALET, Miss. Sci. Cap. Horn., Ois. pp. 98 & 99.

*Phrygilus coracinus*, n. sp., Tarapacá, N. Chili, P. L. SCLATER, P. Z. S. 1891, p. 133, pl. xiii.

#### Family ALAUDIDÆ.

*Otocoris pratincola*, in S. Carolina; L. M. LOOMIS, Auk, viii, pp. 56-59.

*Calandrella brachydactyla*, figured; LORD LILFORD, Col. Fig. Br. Birds, pt. xvii: in Ireland; H. SEEBOHM, Ibis, 1891, p. 586.

*Mirafra albicauda*, n. sp., Gonda, Central East Africa; A. REICHENOW, J. f. O. 1891, p. 223.

*Annomanes lusitanica parvirostris*, n. subsp., E. HARTERT, J. f. O. 1890, p. 156. [= *A. phenicuroides*, Blyth, *id. op. cit.* 1891, p. 110, and Kat. Vög. Senck. Mus. p. 41, note.

#### Family MOTACILLIDÆ.

*Motacilla alba* and *M. lugubris*, in Notts; F. B. WHITLOCK, Naturalist, 1891, pp. 183-185. *M. alba*, notes on; H. A. MACPHERSON, t. c. pp. 211 & 212, and O. V. APLIN, t. c. pp. 349-351.

*Budytes beema*, in Italy; T. SALVADORI, Boll. Mus. Torino, vi, pp. 1-3.

*Macronyx wintoni*, n. sp., Kavirondo, Equat. Africa, R. B. SHARPE, Ibis, 1891, p. 444. *M. aurantiigula*, n. sp., Pangani River, A. REICHENOW, J. f. O. 1891, p. 222.

*Anthus arboreus*, figured; LORD LILFORD, Col. Fig. Br. Birds, part xvii. *A. obscurus*, *A. campestris*, and *A. spipoletta*, figured; *id. op. cit.* part. xviii.

#### Family MNIOTILTIDÆ.

Remarks on various Costa Rican species; G. K. CHERRIE, P. U. S. Nat. Mus. xiv, pp. 524-528.

*Helminthophila bachmani*, in N. Carolina; C. S. BRIMLEY, Auk, viii, pp. 316 & 317: its habits and plumages described; W. BRÉWSTER, *t. c.* pp. 149-157. *H. leucobronchialis*, in Louisiana; F. M. CHAPMAN, *t. c.* p. 318.

*Dendroica pityophila bahamensis*, n. subsp., Bahamas, C. B. CORY, *t. c.* p. 348. *D. gracie*: nest; S. B. LADD, *t. c.* pp. 314 & 315. *D. vigorsii*: its breeding habits; C. S. BRIMLEY, *t. c.* pp. 199 & 200.

*Geothlypis palpebralis*, in Texas; J. A. ALLEN, *t. c.* p. 316.

*Basileuterus salvini*, n. sp., Guatemala, G. K. CHERRIE, P. U. S. Nat. Mus. xiv, pp. 340-342.

### Family CETHIIDÆ.

*Tichodroma muraria*, in the West of France; L. BUREAU, Bull. Soc. Ouest Fr. i, pp. 115-122, pl. iv.

### Family SITTIDÆ.

*Sitta carolinensis lagunæ*, n. subsp., Lower California, W. BREWSTER, Auk, viii, p. 149.

### Family MELIPHAGIDÆ.

*Chondestes angustipluma*, figured; S. B. WILSON & A. H. EVANS, Av. Haw. pt. ii: its systematic position; H. GADOW, *t. c.* p. 10.

*Acrulocercus braccatus*, its anatomy; *id. t. c.* pp. 7-9, pls. ii & iii, figs. 21-35.

*Anthornis melanura*, notes on; A. REISCHEK, MT. orn. Ver. Wien, 1891, pp. 17 & 18.

*Pogonornis cincla*, notes on; *id. t. c.* pp. 97-99.

*Tropidorhynchus neglectus*, n. sp., Flores and Sumbawa, J. BÜTTIKOFER Notes Leyd. Mus. xiii, pp. 213 & 214.

*Prothemadera novæ zeelandiæ*: habits; A. REISCHEK, MT. orn. Ver. Wien, 1891, pp. 213 & 214.

*Ptilotis procerior taviunensis* and *P. procerior buaensis*, n. subsp., Taviuni and Bua, Fiji Archipelago, L. W. WIGLESWORTH, Abh. zool. Mus. Dresden, No. 6, pp. 34 & 35.

*Myzomela pulchella*, n. sp., New Ireland, T. SALVADORI, Agg. Orn. Pap. iii, App. p. 231.

### Family NECTARINIIDÆ.

*Nectarinia æneigularis*, n. sp., Sotik, Central E. Africa; R. B. SHARPE, Ibis, 1891, p. 444.

*Æthopyga latouchii*, n. sp., Swatow, China, H. H. SLATER, Ibis, 1891, pp. 43 & 44, pl. i.

*Cinnyris viridisplendens*, n. sp., Bukoba, Victoria Nyanza, A. REICHENOW, Ber. Allg. Deutsch. Orn. Ges. ix, p. 4. *C. suahelica*, n. sp., E. Africa, A. REICHENOW, J. f. O. 1891, p. 161. *C. reichenowi*, n. sp., Sotik, Central E. Africa, R. B. SHARPE, Ibis, 1891, p. 444, pl. xii, fig. 2.

## Family DICEIDÆ.

*Dicaeum erythrorhynchus*: nest and egg figured; H. E. BARNES, J. Bomb. Soc. v, pl. to p. 315.

## Family ZOSTEROPIDÆ.

Notes on the structure of the tongue in the family; F. E. BEDDARD, Ibis, 1891, pp. 510-512.

*Zosterops kikuyuensis*, n. sp., R. B. SHARPE, Ibis, 1891, p. 444, pl. xii, fig. 1. *Z. tristis*, n. sp.?, Madagascar, E. HARTERT, Kat. Vög. Senck. Mus. p. 31, note. *Z. stejnegeri*, n. sp., Fatsizio I., Japan, H. SEEBOHM, Ibis, 1891, pp. 273 & 274.

## Family PARIDÆ.

*Parus ombriosus* [Zool. Rec. xxvii, *Aves*, p. 54], figured; E. G. MEADE-WALDO, Ibis, 1890, pl. xiii.

*Pacilia palustris macroura*, n. subsp., E. Siberia, L. TACZANOWSKI, Mém. Ac. Pétersb. (7) xxxix, pp. 436-438.

*Ægithalus coronatus*, figured; R. B. SHARPE, Sci. Results Yark. Miss., *Aves*, pl. vii.

*Leptopacile sophiæ*, figured; *id. t. c.* pl. viii.

## Family LANIIDÆ.

*Lanius excubitor*, in Scotland; H. A. MACPHERSON, Scot. Nat. 1891, pp. 60-67, and Zool. xlix, pp. 96-100; J. BACKHOUSE, *t. c.* pp. 310 & 311. *L. major*: notes on the coloration; O. V. APLIN, *t. c.* p. 187, and J. BACKHOUSE, *t. c.* pp. 310 & 311. *L. dorsalis*, Cab., described; R. B. SHARPE, Ibis, 1891, pp. 596 & 597. *L. mackinnoni*, n. sp., Kikuyu, Central E. Africa, *id. t. c.* p. 444, pl. xiii. *L. (Fiscus) newtoni*, n. sp., St. Thomas, W. Africa, J. v. BARBOZA DU BOCAGE, J. Sci. Lisb. (2) pp. 79 & 80. *L. raddei*, notes on; H. SCHALOW, J. f. O. 1891, pp. 37 & 38.

*Laniarius castaneiceps*, n. sp., Mt. Elgon, Central E. Africa, R. B. SHARPE, Ibis, 1891, pp. 445-559.

*Dryoscopus albofasciatus*, n. sp., E. Africa, *id. t. c.* p. 598.

*Telephonus minutus*, notes on; A. REICHENOW, J. f. O. 1891, pp. 385 & 386.

*Prionops cristatus* distinct from *P. poliocephalus*; R. B. SHARPE, Ibis, 1891, pp. 601 & 602.

*Pachycephala*: review of the Fijian species; H. SEEBOHM, Ibis, 1891, pp. 93-99. *P. aurantiiventris*, n. sp., Vanua Levu, *id. t. c.* p. 96. *P. occidentalis*: nest (pl. i, fig. 2) and egg (pl. i, fig. 4) figured; A. J. CAMPBELL, P. R. Soc. Vict. iii (n.s.) p. 2.

*Eopsaltria georgiana*: nest (pl. i, fig. 1) and egg (pl. ii, fig. 1) figured; *id. t. c.* p. 3.

*Bradyornis muscipapina*, n. sp., Bagamoyo, G. HARTLAUB, Abh. Ver. Brem. xii, p. 9.

*Rhectes brunneicaudus*, n. sp., New Guinea, A. B. MEYER, Abh. zool. Mus. Dresden, 1891, p. 10.

### Family ARTAMIDÆ.

*Artamus*. The Skull figured, showing the affinity of the *Artamidæ* to the *Laniidæ*; R. B. SHARPE, Osteol. Cat. Coll. Surg. Aves, p. 26.

### Family VIREONIDÆ.

*Vireo superciliaris*, n. sp., Costa Rica, G. K. CHERRIE, P. U. S. Nat. Mus. xiv, p. 340. *V. solitarius lucasanus*, n. subsp., Lower California, W. BREWSTER, Auk, viii, pp. 147 & 148.

### Family TURDIDÆ.

*Turdus fuscatus* in Norway; R. COLLETT, Forh. Selsk. Chr. 1890 [1891], No. 4, pp. 1-3. *T. auritus*: egg figured; T. PLESKE, Wiss. Result. Przew. Reis. Zool. Th. pt. ii, taf. v, fig. 1. *T. migratorius*, in England; H. SEEBOHM, Zool. xlix, p. 219. *T. atrigularis*, in Scotland; H. M. DRUMMOND-HAY, Tr. Perthsh. Soc. i, pp. 134-138.

*Merula elgonensis*, n. sp., Mt. Elgon, Central E. Africa, R. B. SHARPE, Ibis, 1891, p. 445. *M. kessleri*: egg figured; T. PLESKE, Wiss. Result. Przew. Reis. Zool. Th. pt. ii, taf. v, fig. 2.

*Mimocichla verillorum*, n. sp., Dominica, J. A. ALLEN, Auk, viii, p. 217. Is *M. albiventris*, Sclater; *id. t. c.* p. 217.

*Phœornis lanaiensis*, n. sp., S. B. WILSON, Ann. N. H. (6) vii, p. 460: figured; *id.* & A. H. EVANS, Av. Haw. pt. ii. *P. obscura*: its anatomy; H. GADOW, in Wilson & Evans, Av. Haw. pt. ii, pp. 2-4, pl. 1, figs. 1-5.

*Cossypha polioptera*, n. sp., Bukoba, Victoria Nyanza, A. REICHENOW, Ber. Allg. Deutsch. Orn. Ges. ix, p. 5.

*Stiphronis albiterminata*, not a Sunbird; *id.* J. f. O. 1891, pp. 68 & 69.

*Ædon galactodes*, figured; W. BORRER, B. Sussex, pl. ii.

*Erithacus cairii* and *E. titis*, notes on; H. SCHALOW, J. f. O. 1891, pp. 32 & 33.

*Ruticilla schisticeps*: egg figured; T. PLESKE, Wiss. Result. Przew. Reis. Zool. Th. pt. ii, taf. v, fig. 6. *R. frontalis*: egg figured; *id. t. c.* taf. v, fig. 5.

*Calliope pectoralis*, figured; M. A. MENZBIER, Orn. Turkest. pl. xlix. *C. tschebaiewi*: egg figured; T. PLESKE, Wiss. Result. Przew. Reis. Zool. Th. pt. ii, taf. v, fig. 9.

*Erythropygia*: remarks on the genus; A. REICHENOW, J. f. O. 1891, pp. 61-63. *E. vulpina*, n. sp., Teita, *id. t. c.* p. 63. *E. brunneiceps*, n. sp., Nguruman, E. Africa, *id. ibid.* *E. hartlaubi*, n. sp., Mutjara, E. Africa, *id. ibid.*: G. HARTLAUB, Abh. Ver. Brem. xii, pp. 9 & 10.

*Pratincola maura*, var. *przewalskii* (Zool. Rec. xxvi, *Aves*, p. 51), figured; T. PLESKE, Wiss. Result. Przew. Reis. Zool. Th. pt. ii, taf. iv, figs. 1-3.

*Myrmecocichla cryptoleuca*, n. sp., Kikuyu, Central E. Africa; R. B. SHARPE, Ibis, 1891, p. 445.

*Saxicola montana*: egg figured; T. PLESKE, Wiss. Result. Przew. Reis. Zool. Th. pt. ii, taf. v, fig. 4. *S. deserti*: egg figured; *id. t. c.* taf. v, fig. 3.

*Accentor alpinus*, var. *rufilatus*, figured; *id. t. c.* taf. iv, fig. 4.

### Family SYLVIIDÆ.

*Sylvia nisoria* and *S. curruca*, in Ireland; H. SEEBOHM, Ibis, 1891, pp. 585-587. *S. lugens*, Rüpp., is a *Parisoma*; R. B. SHARPE, *t. c.* pp. 443 & 444, note. *S. momus* distinct from *S. mystacea*; H. C. DRESSER, *t. c.* pp. 362 & 363. *S. persica*, notes on; E. HARTERT, Kat. Vög. Senck. Mus. pp. 14 & 250.

*Hypolais icterina*, in Yorkshire; J. CORDEAUX, Naturalist, 1891, p. 241.

*Phylloscopus bonellii*, in Siebenbürgen; E. V. CZYNYK, Orn. Jahrb. ii, pp. 206-208. *P. tyleri*, figured; R. B. SHARPE, Sci. Results Yark. Miss., *Aves*, pl. x. *P. tristis*, ♂ ♀ (figs. 1 & 2); *P. tristis*, var. *sindiana* ♂ ♀ (figs. 3 & 4): figured; T. PLESKE, Wiss. Result. Przew. Reis. Zool. Th. taf. ii.

*Reguloides superciliosus*, var. *mandellii*, ♂ figured; *id. t. c.* taf. ii, fig. 5.

↓ *Lophobasilus*, n. g. Type, *L. elegans* (Przew.); *id. t. c.* pp. 95 & 96. *L. elegans*, ♂ ♀, figured; *id. t. c.* taf. vi, figs. 1 & 2.

*Leptopæcilæ sophiæ*, ♂ ♀, figured; *id. t. c.* taf. vi, figs. 3 & 4. *L. obscura*, juv. figured; *id. t. c.* taf. vi, fig. 5.

*Calamoherbe griseldis*, n. sp., Nguru, E. Africa, G. HARTLAUB, Abh. Ver. Brem. xii, pp. 7 & 8.

*Acrocephalus* and *Calamoherbe*: notes on species; G. VALLON, Boll. Soc. Adr. xiii, pp. 43-80, pls. i-vi.

*Acrocephalus palustris*, figured; *id. t. c.* tav. i, fig. 1. *A. arundinacea*, figured; *id. t. c.* fig. 2. *A. turdoides*, ♂ ad. et juv., figured; *id. t. c.* tav. 2 & 3. *A. aquaticus*, figured; W. BORRER, B. Sussex, pls. ii & iii. *A. orientalis*: egg figured; T. PLESKE, Wiss. Result. Przew. Reis. Zool. Th. pt. ii, taf. v, fig. 8.

*Calamoherbe phragmitis*, figured; G. VALLON, Boll. Soc. Adr. xiii, tav. 4, fig. 1. *C. aquatica*, figured; *id. t. c.* tav. 4, fig. 2.

*Luscinola melanopogon*, figured; J. FRIVALDSKY, Av. Hung. pl. to p. 47.

*Dumeticola thoracica*, egg figured; T. PLESKE, Wiss. Result. Przew. Reis. Zool. Th. pt. ii, taf. v, fig. 7.

*Tribura major*, figured; R. B. SHARPE, Sci. Results Yark. Miss., *Aves*, pl. ix.

*Cettia orientalis*, figured; *id. t. c.* pl. xi. *C. cetti*, figured; G. VALLON, Bol. Soc. Adr. xiii, tav. 5 & 6.

*Herbivocula armandi*, egg figured; T. PLESKE, Wiss. Result. Przew. Reis. Zool. Th. pt. ii, taf. v, fig. 10.

*Camaroptera*: remarks on the genus; A. REICHENOW, J. f. O. 1891, pp. 64-66. *C. pileata*, n. sp., Zanzibar, *id. t. c.* p. 66. *C. congica*, n. sp., Congo, *id. t. c.* p. 67.



*Euprinodes golzi*, Rehnw., = *E. flavocincta* [Sharpe]; A. REICHENOW, J. f. O. 1891, pp. 67 & 68. *E. cinereus*, n. sp., Mt. Elgon, E. Africa; R. B. SHARPE, Ibis, 1891, p. 120.

*Eremomela*; notes on the genus. *E. mentalis* distinct from *E. scotops*; A. REICHENOW, J. f. O. 1891, p. 63. *Tricholais occipitalis* is an *Eremomela*; *id. ibid.* *E. salvadorii*, n. sp., Leopoldsville, Congo, *id. t. c.* p. 64. *E. citriniceps* distinct from *E. pulchra*; *id. ibid.*

*Sylviella rufigenis*, Reichenow, is an *Eremomela*; *id. ibid.* *S. leucophrys*, n. sp., Mt. Elgon, E. Africa, R. B. SHARPE, Ibis, 1891, p. 121.

*Apalis pulchra*, n. sp., Mt. Elgon, E. Africa, *id. t. c.* p. 119. *A. jacksoni*, n. sp., Mt. Elgon, *id. ibid.*

*Apalis mystacalis*, n. sp., Bukoba, Victoria Nyanza, A. REICHENOW, Ber. Allg. Deutsch. Ges. ix, p. 5. (Is *A. jacksoni*, ♀.)

*Malurus coronatus*: its habits; W. BURTON, Humming B. i, pp. 27 & 28.

*Phyllergates sumatranus*, n. sp., Sumatra, T. SALVADORI, Ann. Mus. Genov. (2) xii, pp. 67 & 68 [av. juv.].

*Cisticola robusta* distinct from *C. erythrogenys*; E. HARTERT, Kat. Senck. Mus. p. 17, note.

*Cisticola fischeri*, n. sp., Naiwascha Lake, A. REICHENOW, J. f. O. 1891, pp. 162 & 163. *C. angusticauda*, n. sp., Gonda, Central E. Africa, *id. t. c.* p. 69.

### Family TROGLODYTIDÆ.

Remarks on Costa Rican species of Wrens; G. K. CHERRIE, P. U. S. Nat. Mus. xiv, pp. 517-524.

*Campylorhynchus brunneicapillus*, notes on; A. W. ANTHONY, Zool. ii, pp. 133 & 134. *C. chiapensis*, n. sp., Chiapas, Mexico, O. SALVIN & F. D. GODMAN, Ibis, 1891, p. 609.

*Cistothorus marianne* in South Carolina; A. T. WAYNE, Auk, viii, p. 239, and R. RIDGWAY, *t. c.* p. 240.

*Salpinctes guttatus*, n. sp., Volcan de San Miguel, Salvador, O. SALVIN & F. D. GODMAN, Ibis, 1891, pp. 609 & 610. *S. fasciatus*, n. sp., Volcan El Viejo, Nicaragua, *id. t. c.* pp. 610 & 611.

### Family MIMIDÆ.

↓ *Allenia*, n. g., type, *A. montana*; C. B. CORY, Auk, viii, p. 42. *Margarops albirostris*, Lawr., and *M. rufus*, Cory, are not separable from *Allenia montana*; *id. t. c.* p. 42.

*Cichlherminia*: notes on the genus; *id. t. c.* pp. 43 & 44. Six species recognized, and their synonymy given; *id. ut supra.* *C. lawrencii*, n. sp., Montserrat, W. Indies, *id. t. c.* p. 44.

*Mimus polyglottus orpheus*, and *M. polyglottus portoricensis*: notes on; *id. t. c.* pp. 44-46.

## Family TIMELIIDÆ.

*Crateropus sharpii*, n. sp., Uniamuesi; A. REICHENOW, J. f. O. 1891, p. 432.

*Crateropus buxtoni*, n. sp., Suk, Central E. Africa, R. B. SHARPE, Ibis, 1891, p. 445.

*Neocichla kelleni*, Büttik., = *N. gutturalis*, Bocage; A. REICHENOW, J. f. O. 1891, p. 69.

*Malacias capistrata pallida*, n. subsp., N. W. India, E. HARTERT, Kat. Vög. Senck. Mus. p. 21.

*Pomatorhinus gravivox*, remarks on; H. SEEBOHM, Ibis, 1891, p. 373.

*Trichocichla rufa* [Zool. Rec. xxvii, *Aves*, p. 58]: further notes; A. REICHENOW, J. f. O. 1891, pp. 129 & 130.

*Ptilocichla basilanica* [Zool. Rec. xxvii, *Aves*, p. 58], figured; J. B. STEERE, Ibis, 1891, pl. vii.

*Turdirostris leptorhyncha* is a *Calamocichla*, A. REICHENOW, J. f. O. 1891, p. 219.

## Family PYCNONOTIDÆ.

*Xenocichla kikuyuensis*, n. sp., Kikuyu, E. Africa, R. B. SHARPE, Ibis, 1891, p. 118.

*Andropadus cameronensis*, n. sp., Cameroons, A. REICHENOW, Ber. Allg. Deutch. Orn. Ges. ix, p. 4. *A. eugenius*, n. sp., Bukoba, Victoria Nyanza, *id. t. c.* p. 5.

<sup>4</sup>*Myiosobus fulvicauda* [*vide infra*], = *Tricholestes criniger*; *id.* J. f. O. 1891, pp. 432 & 433.

*Irena*: its eggs resemble those of *Dendrocitta*; E. HARTERT, J. f. O. 1891, p. 309.

*Irena elle* [Zool. Rec. xxvii, *Aves*, p. 59], ♂ ♀ figured; J. B. STEERE, Ibis, 1891, pl. viii.

## Family CAMPOPHAGIDÆ.

*Graucalus stephani*, n. sp., New Guinea, A. B. MEYER, Abh. zool. Mus. Dresden, 1891, p. 9. *G. purus*, n. sp., Mt. Elgon, E. Africa, R. B. SHARPE, Ibis, 1891, p. 121.

*Edoliisoma tenuirostre*: nidification; A. J. NORTH, Rec. Austr. Mus. i, No. 8, pp. 177 & 178.

*Pericrocotus wrayi* and *P. cinereigula* probably the same as *P. montanus*; T. SALVADORI, Ann. Mus. Genov. (2) xii, pp. 54 & 55.

## Family MUSCICAPIDÆ.

<sup>1</sup>*Myiosobus*, n. g. Type, *M. fulvicauda*, n. sp., Madagascar, A. REICHENOW, J. f. O. 1891, pp. 210 & 211. [Is *Tricholestes criniger*, from Malacca, an error having been made in the locality of the specimen; *id. t. c.* pp. 432 & 433.]

*Hemichelidon cinereiceps*, from Sumatra ; T. SALVADORI, Ann. Mus. Genov. (2) xii, p. 51.

*Platystira jacksoni*, n. sp., Sotik, Central E. Africa, R. B. SHARPE, Ibis, 1891, p. 445.

*Newtonia amphichroa*, n. sp., Madagascar, A. REICHENOW, J. f. O. 1891, p. 210.

*Muscicapa semitorquata*, note on ; H. E. DRESSER, Ibis, 1891, pp. 363 & 364. *M. parva*, in Ireland ; H. SEEBOHM, t. c. pp. 585 & 586 : in Norfolk ; F. M. OGILVIE, Tr. Norw. Soc. v, pp. 197-199 : near Vienna ; E. PERZINA, Orn. Jahrb. ii, pp. 238-241.

↓*Pedilorchynchus*, n. g. Type, *P. stuhlmanni*, n. sp., Uganda ; A. REICHENOW, Ber. Allg. Deutsch. Orn. Ges. ix, p. 4.

*Gerygone modiglianii*, n. sp., Sumatra, T. SALVADORI, Ann. Mus. Genov. (2) xii, pp. 52 & 53. *G. culicivora* : egg figured ; A. J. CAMPBELL, P. R. Soc. Vict. (n.s.) iii, pl. i, fig. 3.

*Chasiempis* : review of the genus. *C. gayi*, n. sp., Oahu, Sandwich Is. ; S. B. WILSON, P. Z. S. 1891, pp. 164-166. *C. sandwichensis* : its anatomy ; H. GADOW, in Wilson & Evans, Av. Haw. pt. ii, pp. 4 & 5, pl. i, figs. 6-10.

*Trochocercus albonotatus*, n. sp., Mt. Elgon, E. Africa ; R. B. SHARPE, Ibis, 1891, p. 121.

*Abrornis olivacea*, n. sp., Is. of Negros and Samar ; E. L. MOSELEY, t. c. p. 47, pl. ii, fig. 2.

*Cryptolopha nigrorum*, n. sp., I. of Negros ; *id.* t. c. p. 47, pl. ii, fig. i. *C. montis*, from Sumatra, T. SALVADORI, Ann. Mus. Genov. (2) xii, p. 51.

*Monarcha melanonotus aurantiacus*, n. subsp., Kafu, New Guinea ; A. B. MEYER, Abh. zool. Mus. Dresden, 1891, p. 9.

*Niltava decipiens*, n. sp., Sumatra, T. SALVADORI, Ann. Mus. Genov. (2) xii, p. 49.

*Siphia nigrigularis*, n. sp., Mt. Penrisen, Sarawak ; A. H. EVERETT, Ibis, 1891, pp. 45 & 46.

### Family HIRUNDINIDÆ.

*Hirundo rustica* : strange roosting-place ; R. SERVICE, Zool. xlix, p. 352. *H. arctivitta*, n. sp., Mt. Elgon, E. Africa, R. B. SHARPE, Ibis, 1891, p. 119. *H. rufula togoensis*, n. subsp., Togoland, A. REICHENOW, J. f. O. 1891, p. 382.

*Tachycineta meyeri*, in Argentina ; P. L. SCLATER, Ibis, 1891, pp. 16 & 17.

### Section B. OLIGOMYODÆ.

#### Family TYRANNIDÆ.

Remarks on various Costa Rican species ; G. K. CHERRIE, P. U. S. Nat. Mus. xiv, p. 535.

*Empidonax hammondi* : nidification ; J. G. COOPER, Zoe, ii, pp. 104-107.

*Lophotriccus squamicrostus minor*, n. subsp., Costa Rica, G. K. CHERRIE, P. U. S. Nat. Mus. xiv, p. 337. *L. zeledoni*, n. sp., Costa Rica, *id. t. c.* pp. 337 & 338.

↓ *Mecocerciscus*, nom. emend. pro "*Mecocerculus*," Scl. ; F. HEINE & A. REICHENOW, Nomencl. Mus. Heine. p. 139. [Omitted from Zool. Rec. xxvii.]

*Contopus pertinax*, nest ; S. B. LADD, Auk, viii, p. 315. *C. richardsonii peninsulæ*, n. subsp., Lower California, W. BREWSTER, *t. c.* pp. 144 & 145.

### Family COTINGIDÆ.

*Cotinga* : wing-characters figured ; 'Key' to the species ; O. SALVIN & F. D. GODMAN, Biol. Centr. Am. Aves, ii, pp. 136-138.

*Attila* : 'Key' to the Central American species ; *id. t. c.* pp. 132 & 133. *A. gaumeri*, n. sp., Yucatan, *id. t. c.* p. 134. *A. hypoxanthus*, n. sp., Mexico and Guatemala, *id. t. c.* p. 135.

*Pachyrhampus ornatus*, n. sp., Costa Rica, G. K. CHERRIE, P. U. S. Nat. Mus. xiv, p. 338. *P. similis*, n. sp., Nicaragua, *id. t. c.* p. 343.

*Platypsaris aglaie hypophæus*, n. subsp., Honduras, R. RIDGWAY, *t. c.* pp. 467-469. *P. aglaie obscurus*, n. subsp., Costa Rica, *id. t. c.* pp. 474 & 475.

↓ *Prospoietus*, n. g. Type, *P. albinuchus* (Burm.) ; J. CABANIS, Ber. Allg. Deutsch. Orn. Ges. ix, p. 4.

↓ *Xenopsaris*, n. g. Type, *X. albinucha* (Burm.) ; R. RIDGWAY, P. U. S. Nat. Mus. xiv, pp. 479 & 480.

### Division II. TRACHEOPHONÆ.

#### Family DENDROCOLAPTIDÆ.

Remarks on the family and classification of the Central American sub-families ; O. SALVIN & F. D. GODMAN, Biol. Centr. Am. Aves, ii, pp. 145-147.

Remarks on Costa Rican species ; G. K. CHERRIE, P. U. S. Nat. Mus. xiv, pp. 532-534.

#### Subfamily SYNALLAXINÆ.

*Synallaxis pudica*, figured ; O. SALVIN & F. D. GODMAN, Biol. Centr. Am. Aves, ii, pl. xlv, fig. 2.

*Siptornis erythroptis*, figured ; *id. t. c.* pl. xlv, fig. 1. *S. rufigenis*, figured ; *id. t. c.* pl. xlv, fig. 2.

#### Subfamily PHILYDORINÆ.

*Automolus* : remarks on the genus ; O. SALVIN & F. D. GODMAN, Biol. Centr. Am. Aves, ii, pp. 153 & 154. *A. rufobrunneus*, figured ; *id. t. c.* pl. xlv, fig. 2. *A. verapacis*, n. sp., Vera Paz, Guatemala, *id. t. c.* pp. 156 & 157. *A. umbrinus*, n. sp., Guatemala, *id. t. c.* p. 157. *A. guerrensis*, n. sp., *id. t. c.* pp. 157 & 158. *A. fumosus*, n. sp., Panama, *id. t. c.* p. 158.

*Philydor fuscipennis*, figured ; *id. t. c.* pl. xlv, fig. 1.

## Subfamily SCLERURINÆ.

*Sclerurus guatemalensis*, figured ; O. SALVIN & F. D. GODMAN, Biol. Centr. Am. Aves, ii, pl. xlv, fig. 1.

## Subfamily MARGARORNITHINÆ.

*Margarornis rubiginosa* (fig. 1) and *M. brunnescens* (fig. 2) ; O. SALVIN & F. D. GODMAN, Biol. Centr. Am. Aves, ii, pl. xlvii.

†*Deconychura*, n. g. Type, *D. typica*, n. sp., Costa Rica and Panama ; G. K. CHERRIE, P. U. S. Nat. Mus. xiv, pp. 338 & 339.

†*Premnoplex*, n. g. Type, *P. brunnescens* (Scl.) ; *id. t. c.* pp. 339 & 340.

## Subfamily DENDROCOLAPTINÆ.

*Sittosomus* : notes on the genus ; 7 species recognised instead of 3, as by Sclater : *S. chapadensis*, n. sp., Matogrosso (p. 509), *S. æquatorialis*, n. sp., Guayaquil (pp. 509 & 510) ; R. RIDGWAY, P. U. S. Nat. Mus. xiv, pp. 507-510.

*Dendroornis lachrymosa*, figured ; O. SALVIN & F. D. GODMAN, Biol. Centr. Am. Aves, ii, pl. xlviii, fig. 1.

*Xiphorhynchus pusillus*, figured ; *id. t. c.* pl. xlviii, fig. 2.

## Subfamily FURNARIINÆ.

*Upucerthia jelskii*, in Chili ; P. L. SCLATER, P. Z. S. 1891, p. 134.

## Family FORMICARIIDÆ.

*Thamnophilus albicrissus*, n. sp., Trinidad ? , R. RIDGWAY, P. U. S. Nat. Mus. xiv, p. 481. *T. trinitatis*, n. sp., Trinidad, *id. t. c.* p. 481.

†*Rhopocichla*, n. g. Type, *Myiothera ardesiaca*, Wied. ; J. A. ALLEN, Bull. Am. Mus. Nat. Hist. iii, p. 199.

*Myrmeciza intermedia*, n. sp., Costa Rica, G. K. CHERRIE, P. U. S. Nat. Mus. xiv, pp. 345 & 346. *M. immaculata occidentalis*, n. subsp., Costa Rica, *id.* Auk, viii, pp. 191-193.

*Pithys bicolor olivascens*, n. subsp., Honduras, R. RIDGWAY, P. U. S. Nat. Mus. xiv, p. 469.

*Grallaria lizanoi*, n. sp., Costa Rica, G. K. CHERRIE, *t. c.* pp. 342 & 343.

## Family PTEROPTOCHIDÆ.

*Scytalopus argentifrons*, n. sp., Costa Rica, R. RIDGWAY, P. U. S. Nat. Mus. xiv, pp. 475 & 476.



# REPTILIA AND BATRACHIA.

BY

G. A. BOULENGER.

The titles are distributed in the various parts of the Record of *Reptilia* and *Batrachia*, being classified as follows, viz. :—

1. WORKS AND PAPERS DEALING WITH BOTH  
REPTILIA AND BATRACHIA, p. 1.
2. FAUNISTIC, p. 2.
3. PALÆONTOLOGICAL, p. 4.
4. REPTILIA, p. 5.
5. BATRACHIA, p. 18.

## GENERAL.\*

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A table is given showing the distribution of the teeth on the palate in *Stegocephala*, *Batrachia*, and *Reptilia*.

\* An asterisk prefixed to a quotation indicates that the Recorder has not seen the Journal or Work referred to.

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## REPTILIA.

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The so-called "Columella" (Epipterygoid of Parker) is the homologue of the "Processus ascendens" of the Urodele quadrate.

SCHWALBE, G. Ueber Auricularhöcker bei Reptilien; ein Beitrag zur Phylogenie des äusseren Ohres. *T. c.* pp. 43-53, fig.

BOAS, J. E. V. Zur Morphologie der Begattungsorgane der amnioten Wirbelthiere. *Morph. JB.* xvii, pp. 271-287, figs., pl. xvi.

Reptiles, pp. 272-274.

CORNING, H. K. Ueber die sog. Neugliederung der Wirbelsäule und über das Schicksal der Urwirbelhöhle bei Reptilien. *T. c.* pp. 611-622, pl. xxx.

HOFFMANN, C. K. Over de Ontwikkelingsgeschiedenis van het Gehoor-organ en de morphologische Betekenis van het Gehoorbeentje bij de Reptiliën. *Verh. Ak. Amst.* xxviii (1890), pp. 1-30, pls. i-iii.

GOLDSTEIN, H. Beiträge zur Kenntniss des Eizahnes bei den Reptilien. *Verh. deutsch. odontol. Ges.* ii, pp. 153-168, 2 pls.

OPPEL, A. Die Befruchtung des Reptilieneies. *Anat. Anz.* vi, pp. 536-544, figs.

F. WERNER, *Biol. Centralbl.* xi, pp. 358-372, has further observations on the markings of Reptiles and their interpretation from a phylogenetic point of view.

## SQUAMATA.

BOULENGER, G. A. Notes on the Osteology of *Heloderma horridum* and *H. suspectum*, with remarks on the Systematic Position of the *Helodermatidae*, and on the Vertebræ of the Lacertilia. *P. Z. S.* 1891, pp. 109-118, figs.

The Order *Squamata* is divided into five Suborders, viz, *Dolichosauria*, *Pythonomorpha*, *Lacertilia*, *Rhiptoglossa*, and *Ophidia*, which are characterized by the structure of the limbs and vertebral column.

F. WERNER, *Biol. Centralbl.* xi, pp. 694-698, records his observations on the casting of the epidermis in Lizards and Snakes.

## LACERTILIA.

G. A. BOULENGER, *P. Z. S.*, 1891, pp. 113-115, 169 & 170, figs., has notes on the vertebræ of various Lacertilia.

SEILLER, R. v. Ueber die Zungendrüsen von *Anguis*, *Pseudopus*, und *Lacerta*. Ein Beitrag zur Kenntniss der einzelligen Drüsen. *Arch. mikr. Anat.* xxxviii, pp. 177-264, pls. x-xiii.

GIACOMINI, E. Ueber die Entwicklung von *Seps chalcides*. Vorläufige Mittheilung. Anat. Anz. vi, pp. 548-551.

— . Materiali per la storia dello sviluppo del *Seps chalcides*. Comunicazione preliminare. Monit. Zool. Ital. ii, pp. 179-192 & 193-211, pl. iii. French translation in Arch. Ital. Biol. xvi, pp. 332-359, pl. —.

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HOCHSTETTER, F. Ueber die Entwicklung der Extremitätsvenen bei den Amnioten. T. c. pp. 1-43, pls. i-iii.

Pp. 4-17, pl. i, relate to *Lacerta agilis*.

WENCKEBACH, K. F. Der Gastrulationsprozess bei *Lacerta agilis*. Anat. Anz. vi, pp. 57-61 & 72-77, figs.

DELBŒUF, J. La psychologie des lézards. Rev. Sci. xlvii, pp. 210-212, & xlviii, pp. 437-439.

#### GECKONIDÆ.

*Saurodactylus mauritanicus*, D. & B., figured by BOULENGER, Tr. Z. S. xiii, pl. xiii, fig. 1.

*Pristurus crucifer*, Val. : notes by BOULENGER, Ann. Mus. Genov. (2) xii, p. 6.

*Ptyodactylus lobatus*, var. *oudrii*, Lataste, figured by BOULENGER, Tr. Z. S. xiii, pl. xiii, fig. 2.

*Lygodactylus miops*, n. sp., GÜNTHER, Ann. N. H. (6) viii, p. 287, Madagascar.

*Tarentola mauritanica*, n. var. *angustimentalis*, STEINDACHNER, Anz. Ak. Wien, 1891, p. 144, SB. Ak. Wien, c. i, p. 305, and Ann. Hofmuseum Wien, vi, p. 302, Canary Is. : n. var. *deserti* (Lataste), BOULENGER, Tr. Z. S. xiii, p. 115, pl. xiii, fig. 3, Sahara.

*Sphaerodactylus microlepis*, R. & L., described by BOULENGER, P. Z. S. 1891, pp. 351-353. *S. vincenti*, n. sp., *id. t. c.* p. 354, St. Vincent, W.I.

#### AGAMIDÆ.

*Draco quinquefasciatus*, Gray, recorded from Borneo by BOULENGER, Ann. N. H. (6) viii, p. 288. *D. walkeri*, n. sp., *id. op. cit.* vii, p. 279, Timor.

*Aphaniotis acutirostris*, Modigliani, recorded from Borneo by BOULENGER, *op. cit.* viii, p. 288.

*Pelturagonia cephalum*, Mocq., = *Japalura nigrilabris*, Pts.; *id. op. cit.* vii, p. 342.

*Calotes andamanensis*, n. sp., *id. op. cit.* viii, p. 288, Andaman Is.

*Agama tournevillei*, Lataste, pl. xiii, fig. 4, and *bibronii*, A. Dum., pl. xiv, fig. 1, figured by BOULENGER, Tr. Z. S. xiii. *A. robecchii*, n. sp., *id. Ann. Mus. Genov.* (2) xii, p. 6, pl. i, fig. 1, Somaliland.

## IGUANIDÆ.

*Anolis acutirostris*, n. sp., IVES, P. Ac. Philad. 1891, p. 459, Yucatan.

*Anisolepis grilli*, n. sp., BOULENGER, Ann. Mus. Genov. (2) x, p. 909, Palmeira, Prov. Parana.

✓ *Aptycholemus*, n. g., allied to *Urostrophus*, D. & B., and *Anisolepis*, Blgr.; *id.* Ann. N. H. (6) viii, p. 85. *A. longicauda*, n. sp., *id. ibid.*, Riacho del Oro, Argentina.

*Ctenoblepharis adspersus*, Tsch.: note by STEINDACHNER, SB. Ak. Wien. c. i, p. 297. *C. stolzmanni*, n. sp., *id.* Anz. Ak. Wien, 1891, p. 143, and *t. c.* p. 295. *C. jamesii*, n. sp., BOULENGER, P. Z. S. 1891, p. 3, pl. i, Tarapaca, Chili.

*Liolaemus lenzi*, n. sp., BÖTTGER, Zool. Anz. xiv, p. 344, Bolivia.

*Uraniscodon plica*, L.: notes on the habits; R. R. MOLE & F. W. URICH, P. Z. S. 1891, p. 448.

*Tropidurus*, Wied.: remarks on the Galapagos species recently described by Cope & Baur; BOULENGER, Ann. N. H. (6) vii, p. 501.

*Iguana tuberculata*, Laur.: notes on its reproduction; PERACCA, Boll. Mus. Zool. Anat. Comp. Torino, vi, No. 110.

*Sauromalus hispidus*, n. sp., STEJNEGER, P. U. S. Nat. Mus. xiv, p. 409, Angel de la Guardia I., Gulf of California.

*Sceloporus variabilis*, Wiegman.: note on its synonymy and geographical distribution in the United States; *id. t. c.* p. 485.

## ZONURIDÆ.

*Zonurus jonesii*, n. sp., BOULENGER, Ann. N. H. (6) vii, p. 417, Transvaal.

## HELODERMATIDÆ.

Notes on the osteology and systematic position; BOULENGER, P. Z. S. 1891, pp. 109–118, figs. Further remarks by SHUFELDT, Nature, xlv, p. 294, and by BOULENGER, *t. c.* p. 444. On some points in the soft anatomy; C. STEWART, P. Z. S. 1891, pp. 119–121, pl. xi, and SHUFELDT, Nature, xliii, p. 514.

R. W. SHUFELDT, N. Y. Med. J. liii (No. 651), pp. 581–584, reviews the medical and other opinions upon the poisonous nature of the bite of *Heloderma suspectum*, and gives a figure of the animal.

## VARANIDÆ.

✓ *Proganosaurus pertinax*, n. g. & sp., for fragments of vertebræ, referred with doubt to the *Varanidæ*, from the Pliocene of Tuscany; PORTIS, Rettili pliocenici del Valdarno superiore (1890), p. 25, pl. i, figs. 5–7.

## TEIIDÆ.

On colour patterns in *Cnemidophorus gularis*, B. & G., and *C. tessellatus*, Say; COPE, Am. Nat. xxv, p. 1135.

*Cnemidophorus martyris*, n. sp., STEJNEGER, P. U. S. Nat. Mus. xiv, p. 407, S. Pedro Martir I., Gulf of California.

*Oreosaurus guentheri*, n. sp., BÆTTGER, Zool. Anz. xiv, p. 345, Bolivia.

## LACERTIDÆ.

*Lacerta ocellata*, var. *patzr*, Lataste, figured by BOULENGER, Tr. Z. S. xiii, pl. xv. *L. muralis*, Laur.: R. BLANCHARD, Mém. Soc. Zool. iv, p. 502, pl. iv, describes and figures some colour-varieties from the West Coast of Brittany (n. vars. *oyensis*, *calbia*); and F. WERNER, Verh. z.-b. Ges. Wien, xli, p. 751, remarks on the varieties inhabiting Istria and Dalmatia (n. vars. *maculiventris*, *lissana*, *fiumana*, *striata*). *L. oxycephala*, D. & B.: note on the habits, WERNER, Zool. Gart. xxxii, p. 226; on a new variety (*L. tomasinii*): SCHREIBER, Verh. z.-b. Ges. Wien, xli, p. 580. *L. mosorensis*, Kolombatović (Irm. kralj. Dalm. ii, 1886), described and compared with *L. oxycephala*, by SCHREIBER, t. c. p. 574. *L. galloti*, D. & B., and *atlantica*, Ptrs. & Doria, described by STEINDACHNER, Ann. Hofmuseum Wien, vi, pp. 288 & 294. *L. simonyi*, Stdr., described; *id. t. c.* p. 290; and described and figured by BOULENGER, P. Z. S. 1891, p. 201, pls. xviii & xix.

*Algiroides nigropunctatus*, D. & B.: note on the habits; WERNER, Zool. Gart. xxxii, p. 225.

*Psammodromus blanci*, Lataste, figured by BOULENGER, Tr. Z. S. xiii, pl. xiv, fig. 2.

*Eremias brenneri*, Ptrs. (= *edwardsii*, Mocq.), and *mucronata*, Blanf.: notes by BOULENGER, Ann. Mus. Genov. (2) xii, pp. 8 & 9. *E. erythrosticka*, n. sp., *id. t. c.* p. 10, pl. i, fig. 2, Somaliland.

## GERRHOSAURIDÆ.

*Zonosaurus quadrilineatus*, Grand., and *laticauda*, Grand.: note by STEINDACHNER, SB. Ak. Wien, c. i, p. 298. *Z. bættgeri*, n. sp., *id. Anz.* Ak. Wien, 1891, p. 143, and SB. Ak. Wien, c. i, p. 297, pl. ii, fig. 1, Nossi Bé, Madagascar.

## SCINCIDÆ.

*Egernia whitii*, Lacép., figured by MCCOY, Prodr. Zool. Vict., Dec. xx, pl. exci, fig. 1 (1890).

*Macroscincus coctai*, D. & B., oviparous; PERACCA, Boll. Mus. Zool. Anat. Comp. Torino, No. 105: further notes; *id. t. c.* No. 107.

*Mabuia hildebrandtii*, Ptrs.: notes by BOULENGER, Ann. Mus. Genov. (2) xii, p. 12.

*Lygosoma quoyi*, D. & B., figured by MCCOY, t. c. fig. 2. *L. subcæruleum*, n. sp., BOULENGER, Ann. N. H. (6) viii, p. 289, Travancore. *L. walkeri*, n. sp., *id. t. c.* p. 405, N.W. Australia. *L. kilimensis*, n. sp., STEJNEGER, P. U. S. Nat. Mus. xiv, p. 405, Kilimandjaro.

*Eumeces algeriensis*, Ptrs., figured by BOULENGER, Tr. Z. S. xiii, pl. xvi.

†*Platypholis*, n. g. [name preoccupied, Boulenger, 1890], for *Eumeces altamirani*, n. sp., DUGÈS, Nat. Mex. (2) i, p. 485, pl. xxxii, Michoacan, Mexico.

*Chalcides ocellatus*, Forsk. : remarks by BOULENGER, Ann. Mus. Genov. (2) xii, p. 12 ; vars. *vittatus*, Blgr., and *polylepis*, Blgr., figured, *id.* Tr. Z. S. xiii, pl. xvii, figs. 2 & 3. *C. viridanus*, Gravh. : notes by STEINDACHNER, Anz. Ak. Wien, 1891, p. 143, and SB. Ak. Wien, c. i, p. 300, and Ann. Hofmuseum Wien, vi, p. 297 ; n. vars. *sexlineata*, *simonyi*, and *bistriata*, *id. ibid.*, Canary Is. *C. simonyi*, n. sp., *id. t. c.* pp. 143, 299, & 299, Fuerteventura, Canary Is. [= *C. viridanus*, var.—REC.]. *C. lineatus*, Leuck., figured by BOULENGER, Tr. Z. S. xiii, pl. xvii, fig. 3. *C. spoides*, Aud. : on its habits in confinement ; J. v. FISCHER, Zool. Gart. xxxii, p. 23.

### RHIPTOGLOSSA.

*Chamaeleon höhnelii*, pp. 141 & 307, pl. i, fig. 1, and *leikipiensis*, pp. 142 & 309, pl. i, fig. 2, n. spp., STEINDACHNER, Anz. Ak. Wien, 1891, and SB. Ak. Wien, c. i [= *C. biteniatus*, Fisch.—REC.]. *C. taretensis*, n. sp., *id. t. c.* pp. 142 & 310, pl. i, fig. 3, Taveta, foot of Kilimandjaro, = *C. abbotti*, n. sp., STEJNEGER, Bull. U. S. Nat. Mus. xiv, p. 353, Kilimandjaro. *C. longicauda*, n. sp., GÜNTHER, Ann. N. H. (6) viii, p. 287, pl. xiv, Madagascar.

*Rhampholeon robecchii*, n. sp., BOULENGER, Ann. Mus. Genov. (2) xii, p. 13, pl. i, fig. 3, Somaliland.

### PYTHONOMORPHA.

S. W. WILLISTON has notes on a specimen of *Clidastes (velox*, Marsh, = *cineriarum*, Cope ?) from Kansas ; Science, xviii, p. 345.

### DOLICHOSAURIA.

*Hydrosaurus lesinensis*, Kornhuber (foss.), is referred to this suborder ; BOULENGER, P. Z. S. 1891, p. 115.

### OPHIDIA.

SCLATER, W. L. Notes on the Collection of Snakes in the Indian Museum, with Description of several new species. J. A. S. B. lx, pp. 230–250, pl. vi.

—. List of the Snakes in the Indian Museum. Calcutta : 1891, 8vo, 79 pp.

\*A. DE ZIGNO, Atti (Mem.) Acc. Padova, vi (1890) writes on fossil Tertiary Snakes from Italy.

WERNER, F. Ueber Giftschlangen. Verh. z.-b. Wien, xli, SB., pp. 38 & 39.

E. D. COPE, Am. Nat. xxv, p. 156, fig. 1, remarks on the epiglottis in Colubrine Snakes.

TREADWELL, A. L. On the Development of the Male Copulatory Organ in Snakes. *Am. Nat.* xxv, pp. 490-494, figs.

MCALPINE, D. Observations on the Movements of the Heart of the Copper-head Snake (*Hoplocephalus superbis*, Günth.), in and out of the Body. *P. R. Soc. Vict.* (2) iii, pp. 27-35.

WILLIAMS, J. L. Experiments on Snake Locomotion. *Science*, xviii, pp. 123 & 124.

SIBLEY, W. On the Incubation of Snakes' Eggs. *Rep. Brit. Ass.* 1890, p. 860.

E. D. COPE, *Am. Nat.* xxv, p. 742, remarks on the Snakes known to live in banana bunches.

#### TYPHLOPIDÆ.

*Typhlops platycephalus*, D. & B. (= *Ophthalmidion fuscum*, A. Dum.), described by BOULENGER, *P. Z. S.* 1891, p. 352. *T. (Onychocephalus) newtoni*, n. sp., BOCAGE, *J. Sci. Lisb.* (2) ii, p. 61 (1890), St. Thomé I., W. Africa.

#### GLAUCONIIDÆ.

*Glauconia*, Gray. *Leptotyphlops*, Fitz. (nom. nud.) is revived by STEJNEGER, *P. U. S. Nat. Mus.* xiv, p. 501, to take the place of *Stenostoma*, Wagl., pre-occupied. *Stenostoma rubellum*, Garm., = *S. dulce*, B. & G.; *id. ibid.*

#### BOIDÆ.

*Xiphosoma hortulanum*, L.: notes on the habits; R. R. MOLE & F. W. URICH, *P. Z. S.* 1891, p. 447.

↓ *Hypapistes*, n. g. *Pythoninarum*, for *H. dipsadides*, n. sp., DOUGLAS-OGILBY, *Rec. Austral. Mus.* i, p. 192, Fly River, New Guinea.

#### COLUBRIDÆ.

##### *Aglypha.*

F. WERNER, *Biol. Centralbl.* xi, pp. 698-700, has notes on the parturition of *Coronella austriaca*, and on the character of the eggs in other European *Colubridæ*.

*Culamaria javanica*, n. sp., BOULENGER, *Ann. N. H.* (6) vii, p. 279, Java.

*Lycodon atropurpureus*, Cant.: note by BOULENGER, *Ann. N. H.* (6) vii, p. 462. *L. (Tetragonosoma) effrenis*, Cant., re-described and figured by STEINDACHNER, *SB. Ak. Wien*, c. i, p. 289, pl. ii, fig. 2.

*Boodon*, D. & B.: a synopsis of the species, with indication of the synonyms; BOULENGER, *Ann. Mus. Genov.* (2) xii, p. 14.

*Heterolepis*, Smith, *Gonyonotus*, Mocq., and *Hormonotus*, Hallow.: remarks by BOULENGER, *Ann. N. H.* (6) viii, pp. 344-346.



*Opisthotropis*, Gthr. This genus is defined to include *Calamohydrys*, Blgr., *Helicopsoides*, Mocq., and *Lepidognathus*, Jende, and a synopsis of the four species referred to it is given; BOULENGER, Ann. N. H. (6) vii, p. 343.

✓*Hydrablades*, n. g., for *Ablades periops*, Gthr., and *A. praefrontalis*, Mocq.; *id. ibid.*

*Ablades stoliczkae*, n. sp., W. SCLATER, J. A. S. B. lx, p. 234, pl. vi, fig. 1, Assam [= *A. frenatus*, Gthr.—REC.]

*Coroneilla amaliae*, Bttg.: figured by BOULENGER, Tr. Z. S. xiii, pl. xviii, fig. 1.

*Lampropeltis multistrata*, Kenn., *annulata*, Kenn., and *rhombomaculata*, Holbr.: notes by STEJNEGER, P. U. S. Nat. Mus. xiv, pp. 502 & 503.

*Simotes woodmasoni*, n. sp., W. SCLATER, *t. c.* p. 235, pl. vi, fig. 2, Andamans and Nicobars. *S. meyerinkii*, n. sp., STEINDACHNER, Anz. Ak. Wien, 1891, p. 142, and SB. Ak. Wien, c. i, p. 292, Sulu Is. [= *S. octolineatus*, Schn.—REC.].

*Ahaetulla shirana*, Gthr., = *A. irregularis*, Leach; BOULENGER, P. Z. S. 1891, p. 306.

*Philothamnus punctatus*, Ptrs., = *P. semivariegatus*, Smith; *id. t. c.* p. 307.

*Dromicus cursor*, Bibr., = *D. cubensis*, Garm., = *Liophis andrewae*, R. & L.; *id. t. c.* p. 354.

*Dromicus miolepis*, n. sp., Zool. Anz. xiv, p. 345, Bolivia [= *Rhadinea occipitalis*, Jan.—REC.]

*Bascanium constrictor*, L.: SHUFELDT, Am. Nat. xxv, p. 386, relates how he was once attacked by this snake.

*Zaocys tenasserimensis*, n. sp., W. SCLATER, *t. c.* p. 238, pl. vi, fig. 3, Tenasserim.

*Drymobius margaritiferus*, Schleg., recorded from Texas by STEJNEGER, P. U. S. Nat. Mus. xiv, p. 504.

*Coluber nuthalli*, Theob., = *C. taniurus*, Cope, W. SCLATER, *t. c.* p. 239. *C. sauromates*, Pall., = *C. quadrilineatus*, Bonnat.; BOULENGER, Ann. N. H. (6) vii, p. 280. *C. phyllophis*, n. n. for *Elaphis sauromates*, Gthr., *nec* Pall., = *Phyllophis carinata*, Gthr.; *id. ibid.*

✓*Gonyophis*, n. g., for *Gonyosoma margaritatum*, Ptrs.; *id. op. cit.* viii, p. 290.

*Spilotes variabilis*, L.: notes on the habits; R. R. MOLE & F. W. URICH, P. Z. S. 1891, p. 448.

*Herpetodryas*, Boie: a synopsis of the species; BOULENGER, *t. c.* p. 355. *H. carinatus*, L., n. var. *vincenti*; *id. ibid.*, St. Vincent, W. I. *H. carinatus*, L.: notes on the habits; R. R. MOLE & F. W. URICH, *t. c.* p. 448.

*Dendrophis papuae*, p. 193, and *elegans*, p. 194, n. spp., DOUGLAS-OGILBY, Rec. Austral. Mus. i, Fly River, New Guinea.

*Grayia longicauda*, n. sp., MOCQUARD, Bull. Soc. Philom. (8) iii, CR. p. 9, W. Africa. [= *Xenurophis caesar*, Gthr.—REC.]

*Tropidonotus natrix*, L.: notes on its oviposition; WIEPKEN, Abh. Ver. Brem. xii, p. 162, fig. *T. tessellatus*, Laur., n. var. *flavescens*, WERNER, Verh. z.-b. Wien, xli, p. 766, Dalmatia. *T. pealii*, Assam, and *nico-barensis*, Camorta, Nicobars, n. spp., W. SCLATER, *t. c.* p. 241, pl. vi, figs.

4 & 5. *T. angusticeps*, Blyth, = *T. macrops*, Blyth; *id. t. c.* p. 240. *T. mortoni*, Theob., = *T. rhodomelas*, Boie; *id. t. c.* p. 242. *T. nuchalis*, China, and *asperrimus*, Ceylon, n. spp., BOULENGER, Ann. N. H. (6) vii, p. 281.

*Tretanorhinus*, D. & B.: notes on the species of this genus, by BOCOURT, Le Nat. (2) v, pp. 121 & 208. *T. variabilis*, n. var. *adnexus*; *id. t. c.* pp. 122 & 208, Mexico. *T. mocquardi* and *lateralis*, n. spp., *id. t. c.* p. 122, Central America.

*Tropidoclonium lineatum*, Hall.: notes by H. GARMAN, Bull. Illin. Lab. N. H. iii, p. 187: recorded from St. Louis, Missouri, by STEJNEGER, P. U. S. Nat. Mus. xiv, p. 504. *T. lineatum iowae*, n. subsp., R. E. CALL, Am. J. Sci. (3) xli, p. 298, Iowa.

*Coluber beggiatoi*, Nummulitic Sandstone of Lonigo, and *ombonii*, Monte Bolca, n. spp. (foss.), DE ZIGNO, Atti (Mem.) Acc. Padova, vi (1890).<sup>c</sup> *C. etruscae*, n. sp. (foss.), PORTIS, Rettili pliocenici del Valdarno superiore, p. 23, pl. i, figs. 8-10, Pliocene, Tuscany.

### *Opisthoglypha.*

*Elapomorphus* (*Phalotris*) *tricolor*, D. & B.: note by BETTGER, Abh. naturh. Ges. Nürnberg, viii, p. 91.

*Dromicus clavatus*, Ptrs., = *Coniophanes imperialis*, Baird; STEJNEGER, P. U. S. Nat. Mus. xiv, p. 505.

*Rhamphophis*, Smith [*Amphiophis*, lapsu calami], characterized by BOULENGER, P. Z. S. 1891, p. 307. *Ablabes hildebrandtii*, Pts., = *Coronella nototenia*, Gthr., referred to this genus; *id. ibid.*

*Dipsas multifasciata*, Blyth, is distinct from *D. ceylonensis*, Gthr.; W. SCLATER, J. A. S. B. lx, p. 243. *D. (Heterurus) gainardi*, Schleg.: note by STEINDACHNER, SB. Ak. Wien, c. i, p. 295.

*Mimophis madagascariensis*, Gthr.: note by STEINDACHNER, *t. c.* p. 294.

*Dryophis mycterizans*, Daud., ovoviviparous; H. S. FERGUSON & H. M. PHIPSON, J. Bomb. N. H. Soc. vi, p. 420.

### *Proteroglypha.*

MCCAY, W. J. The Osteology and Myology of the Death Adder (*Acanthophis antarctica*). P. Linn. Soc. N.S.W. (2) iv, pp. 893-986, pls. xxv-xxvii (1890).

*Hoplocephalus frontalis*, n. sp., DOUGLAS-OGILBY, *t. c.* p. 1027 (1890), Australia.

*Elaps* and *Callophis*: notes on the specimens in the Lisbon Museum; FERREIRA, J. Sci. Lisb. (2) ii, pp. 89-95.

*Elaps diastema*, B. & D., n. var. *michoachanensis*, DUGÈS, Nat. Mex. (2) i, p. 487, pl. xxxii, Michoachan, Mexico. *E. mattazoi*, n. sp., FERREIRA, *t. c.* p. 93, Victoria.

*Cullophis intestinalis*, Laur., n. var. *suluensis*, STEINDACHNER, SB. Ak. Wien, c. i, p. 293, Sulu Is.

*Distira cyanocincta*, Daud. : on the presence of grooves in the mandibular teeth ; BOULENGER, P. Z. S. 1890, p. 617.

*Hydrophis trachyceps*, Theob., and *H. crassicollis*, And., = *Distira cyanocincta*, Daud. ; W. SCLATER, J. A. S. B. lx, p. 247.

## VIPERIDÆ.

K. W. DALLA TORRE, Progr. Staats-Gymn. Innsbruck, 1891,\* writes on the Vipers of the Tyrol.

\*BANZER, A. Die Kreuzotter. Ihre Lebensweise, ihr Biss und ihre Verbreitung mit besonderer Berücksichtigung ihres Vorkommens in Bayern. Munich : 1891, 8vo, 48 pp.

*Vipera berus*, L. : on its habits and distribution in Germany ; HAGEN, Abh. naturh. Ges. Nürnberg, viii, p. 51.

*Cerastes vipera*, L., figured by BOULENGER, Tr. Z. S. xiii, pl. xviii, fig. 2. QUELCH, J. J. The Rattlesnake—The Growth of the Rattle. Timehri (2) v, pp. 1-11, pl.

FEOKISTOW, A. Sur la sonnette du *Crotalus durissus*. Bull. Pétersb. (2) i, pp. 1-4 (1889).

*Crotalus durissus*, L. : physiological notes by A. E. FEOKISTOW, Mém. biol. xiii, pp. 1-4. *C. pyrrhus*, Cope, recorded from California by STEJNEGER, West Am. Scientist, vii, p. 165.

## ORNITHOSAURIA.

SEELEY, H. G. The Ornithosaurian Pelvis. Ann. N. H. (6) vii, pp. 237-255, figs.

The author concludes with the following scheme of classification :—

### I. ORNITHOCHEIROIDEA.

Fams. *Ornithocheiridae*, *Pteranodontidae*.

### II. PTERODACTYLIA.

Fam. *Pterodactylidae*.

### III. PTERODERMATA.

Fams. *Dimorphodontidae*, *Rhamphorhynchidae*.

— On the Shoulder-Girdle in Cretaceous Ornithosauria. T. c. pp. 438-445.

R. LYDEKKER, Q. J. Geol. Soc. xlvii, p. 41, pl. v, figs. 3 & 4, has notes on remains of Ornithosaurian quadrates.

A. S. WOODWARD, Ann. N. H. (6) viii, p. 314, fig., notices an Ornithosaurian quadrate from the Cretaceous of the Province of Bahia, Brazil.

*Pteranodon longiceps*, Marsh : on the skull and hind extremity ; WILLISTON, Am. Nat. xxv, p. 1124.

## DINOSAURIA.

G. BAUR, *Am. Nat.* xxv, pp. 434-454, remarks on the Reptiles generally called *Dinosauria*, and, after reviewing the results of recent researches, expresses the opinion that the said group is an unnatural one, and contains three groups which ought to be called *Iguanodontia*, *Megalosauria*, and *Cetiosauria*.

MARSH, O. C. On the Gigantic *Ceratopsidæ* (or Horned Dinosaurs) of North America. *Rep. Brit. Ass.* 1890, pp. 793-795, and *Am. J. Sci.* (3) xli, pp. 167-178, pls. i-x, and *Geol. Mag.* (3) viii, pp. 193-199 & 241-250, pls. iv, v, & vii.

BAUR, G. The Horned Saurians of the Laramie Formation. *Science*, xvii, pp. 216 & 217.

*Triceratops elatus*, n. sp., MARSH, *Am. J. Sci.* (3) xlii, p. 265, Laramie Formation, Wyoming.

↓ *Torosaurus*, n. g. (*Ceratopsidarum*) for *T. latus* and *T. gladius*, n. spp., MARSH, *t. c.* p. 266, Laramie, Wyoming.

*Stegosaurus unguatus*, Marsh : restoration by MARSH, *t. c.* p. 179, pl. ix, and *Geol. Mag.* (3) viii, p. 385, pl. xi.

Restorations of *Triceratops prorsus*, Marsh, and *Brontosaurus excelsus*, Marsh ; MARSH, *Am. J. Sci.* (3) xli, pls. xv & xvi.

*Allops crassicornis*, n. sp., *id. op. cit.* xlii, p. 268, Brontotherium Beds, S. Dakota.

↓ *Brontops validus*, n. sp., *id. t. c.* p. 269, Brontotherium Beds, S. Dakota.

*Titanops medius*, n. sp., *id. ibid.*, Brontotherium Beds, S. Dakota.

*Massospondylus rawesi*, n. sp., for a tooth from Takli, near Nagpur, India (Cretaceous ?), LYDEKKER, *Rec. Geol. Surv. Ind.* xxiii (1890), p. 21, fig.

↓ *Amnosaurus*, n. g. (*Anchisauridarum*), for *Anchisaurus major*, Marsh, and *A. colurus*, n. sp., MARSH, *t. c.* p. 267, Trias, Connecticut Valley.

*Ornithomimus*, Marsh : on a specimen from the Denver Group, Colorado ; CANNON, *P. Colorado Soc.* iii, p. 253.

*Calamosaurus foxii*, Lyd. : on two cervical vertebræ and a tibia ; LYDEKKER, *Q. J. Geol. Soc.* xlvii, p. 42, pl. v, figs. 1 & 2.

↓ *Agrosaurus macgillivrayi*, n. g. & sp., for "Saurischian" limb-bones from the N.E. coast of Australia ; SEELEY, *t. c.* p. 164, figs.

## EMYDOSAURIA.

HOWES, G. B. On the Probable Existence of a Jacobson's Organ among the Crocodilia ; with observations upon the Skeleton of that organ in the Mammalia, and upon the Basi-Mandibular Elements in the Vertebrata. *P. Z. S.* 1891, pp. 148-159, pl. xiv.

VOELTZKOW, A. Ueber Ei-Ablage und Embryonalentwicklung der Krokodile. *SB. Ak. Berl.* 1891, pp. 51-56.

*Alligator sinensis*, Fauvel ; figured, with notes, by BOULENGER, P. Z. S. 1890, p. 619, pls. li & lii.

*Crocodylus toliapicus*, Ow. (foss.), is referred to *Diplocynodon* ; *id. t. c.* p. 7.

*Bottosaurus belgicus*, n. sp. (foss.), A. S. WOODWARD, Geol. Mag. (3) viii, p. 114, pl. iii, fig. 18, Lower Danian of Ciply, Belgium.

*Steneosaurus buretoni*, Zigno (foss.) : notes by OMBONI, Atti Ist. Venet. (7) i, p. 987, pl. — (1890).

✓*Sauvodesmus robertsoni*, n. g. & sp., for a humerus provisionally referred to the *Crocodylia* ; SEELEY, Q. J. Geol. Soc. xlvii, p. 166, figs., Rhætic of Linksfield, Elgin, Scotland.

## CHELONIA.

G. BAUR, J. Morph. iv, pp. 345–359, figs., describes the different types of pelvis in the Chelonians.

HAYCRAFT, J. B. The Development of the Carapace of the Chelonia. Tr. R. Soc. Edinb. xxxvi, pp. 335–342, pl.

ROSENBERG, E. Ueber einige Entwicklungsstadien des Handskelets der *Emys lutaria*, Marsili. Morph. JB. xviii, pp. 1–34, pl. i.

G. RISTORI, Atti Soc. Tosc. vii, Pr. Verb. pp. 304–308, notices some Chelonian remains from the Miocene of Tuscany.

*Trionyx planus*, Ow. (?) : on a skull from the Upper Eocene of Hordwell, Hampshire ; BOULENGER, P. Z. S. 1891, p. 6, fig. *T. melitensis*, n. sp. (foss.), LYDEKKER, Q. J. Geol. Soc. xlvii, p. 37, fig., Miocene, Malta. *T. bambolii*, p. 305, *senensis*, p. 305, *portisi*, p. 306, and *propinquus*, p. 308, n. spp. (foss.), RISTORI, *t. c.*, Miocene, Tuscany.

*Pelochelys poliakowii*, Strauch, = *P. cantoris*, Gray ; BOULENGER, Ann. N. H. (6) vii, p. 283. BAUR, *t. c.* p. 445, remarks on a skull of *Pelochelys* from the Philippines.

*Pseudotrionyx delheidi*, Dollo (foss.), recorded from the Bracklesham Beds, by A. S. WOODWARD, Geol. Mag. (3) viii, p. 546.

*Adocus*, Cope (foss.), is regarded by BAUR as allied to *Dermatemys*, but forming a distinct family, *Adocidae*, which is defined ; P. Ac. Philad. 1891, p. 428.

*Baëna*, Leidy (foss.), is regarded as related to *Pleurosternum*, although deserving to stand as a distinct family, *Baënidae* ; BAUR, *t. c.* p. 425.

*Damonia reevesii*, Gray : on a case of hibernation ; PERACCA, Boll. Mus. Zool. Anat. Comp. Torino, vi, No. 105.

*Clemmys caspica*, Gm. : note on the habits ; WERNER, Zool. Gart. xxxii, p. 230.

*Emys etrusca*, p. 12, pl. ii, figs. 14–16 [= *Clemmys caspica* ?—REC.], *major*, p. 16, and *latens*, p. 16, n. spp. (foss.), PORTIS, Rettili pliocenici del Valdarno superiore. *E. depressa*, *campanii*, and *parva*, n. spp. (foss.), RISTORI, *t. c.* p. 307, Miocene, Tuscany.

*Emys orbicularis*, L.: on its variations in Dalmatia; *id.* Verh. z.-b. Wien, xli, p. 767: on its occurrence in Mecklenberg; L. WILL, Arch. Ver. Mecklenb. xlv, p. 60: on a monstrous specimen; CAMERANO, Boll. Mus. Zool. Anat. Comp. Torino, vi, No. 106, fig.

L. VAILLANT, Ann. Sci. Nat. (7) xii, pp. 50-63, discusses the nomenclature of the various genera into which *Emys* of old authors has been split up. In his opinion, the name *Emys*, in its restricted sense, should be applied to the group of which *E. picta*, Schn., is the type.

*Cistudo*, Flem.: remarks by BAUR, Science, xvii, p. 190, who points out distinctive cranial characters in *C. major*, Ag., and *C. carolina*, L.

*Testudo*, L. In a paper dealing with recently extinct animals, F. A. LUCAS devotes a chapter to the Galapagos and Mascarene Tortoises, with figures of *T. nigrita* and *T. elephantopus*, Smiths. Report, 1889, pp. 643-647, pl. civ. *T. græca*, L.: on its mode of pairing; J. BACHOF, Zool. Gart. xxxii, p. 274. *T. microtympanum*, n. sp., for the skull of an extinct species, probably from Mauritius: BOULENGER, P. Z. S. 1891, p. 4, figs. *T. globosa*, p. 3, pl. i, figs. 1-4 [= *T. græca*.—REC.], *oriens*, p. 9, pl. ii, fig. 12, and *seminota*, p. 10, pl. ii, fig. 13, n. spp. (foss.), PORTIS, Rettili pliocenici del Valdarno superiore, Pliocene of Tuscany.

G. A. BOULENGER remarks on some variations in the skulls of *Chelone mydas* and *Thalassochelys caretta*; P. Z. S. 1890, p. 618.

*Pliochelys derelicta*, n. sp. (foss.), for a fragment of carapace from the Pliocene of Tuscany, PORTIS, *op. cit.* p. 17, pl. ii, figs. 17 & 18. [This fragment the Recorder regards as belonging to the seventh right costal and corresponding marginal of *Thalassochelys caretta*, L.]

*Sternotherus nigricans*, Lacép., and *S. castaneus*, Schw.: on their distinctive characters; VAILLANT, Bull. Soc. Philom. (8) iii, p. 94.

*Hydraspis leithii*, Carter (foss.): note on a fragment of plastron; LYDEKKER, Rec. Geol. Surv. Ind. xxiii (1890), p. 23, fig.

*Compsemys*, Leidy (foss.): the characters discussed by BAUR, P. Ac. Philad. 1891, p. 411, who regards it as allied to *Pleurosternum*.

G. BAUR, Am. Nat. xxv, pp. 631-639, writes on the relations of *Curettochelys insculpta*, Ramsay, and reproduces, pls. xiv-xvi, photographs of the type specimen. The author thinks very probable that the *Curettochelydidae* are very close to the ancestors of the *Trionychoidae*. Also Science, xvii, p. 190.

*Eosphargis gigas*, Ow. (foss.): on fragments of a scapula; LYDEKKER, Q. J. Geol. Soc. xlvii, p. 39, fig.: on a humerus; BOULENGER, P. Z. S. 1891, p. 7, fig.

## ICHTHYOSAURIA.

H. G. SEELEY, Rep. Brit. Ass. 1890, p. 809, remarks on the vertebrae in the Ichthyosaurians.

FRAAS, E. Die Ichthyosaurier der Süddeutschen Trias- und Jura-Ablagerungen. Tübingen: 1891, 4to, 81 pp., 14 pls.

*Ichthyosaurus psilonoti*, n. sp., *id. t. c.* p. 41, Trias of S. Germany. *I. tenuirostris*, Conyb. : notes on and figure of a nearly perfect skeleton ; LYDEKKER, *Geol. Mag.* (3) viii, p. 289, pl. ix. *I. burgundia*, n. sp. (?), GAUDRY, C.R. cxiii, p. 169, Upper Lias of Sainte-Colombe, near Vassy, Yonne.

## PLESIOSAURIA.

A. S. WOODWARD, *Ann. N. H.* (6) viii, p. 316, fig., records a Plesiosaurian propodial bone (humerus ?) from the Cretaceous of the Province of Bahia, Brazil.

*Cimoliosaurus* (*Elasmosaurus* ?) *snowii*, Willist., described by WILLISTON, *Tr. Kansas Ac.* xii, p. 174, fig.

✓ *Eupodosaurus longobardicus*, n. n., for a fossil foot previously described by Curioni as *Lariosaurus balsami* ; BOULENGER, *Ann. N. H.* (6) viii, pp. 293 & 407.

## RHYNCHOCEPHALIA.

G. A. BOULENGER, *P. Z. S.* 1891, pp. 168-172, remarks on the classification of the *Rhynchocephalia*, which he proposes to arrange in two sub-orders and six families :—

Subord. I. PROTEROSAURIA.

Fams. *Palæohatteriida*, *Proterosaurida*.

Subord. II. RHYNCHOCEPHALIA VERA.

Fams. *Hatteriida*, *Homæosaurida*, *Rhynchosaurida*, *Champsosaurida*.

G. BAUR, *Am. Nat.* xxv, pp. 489 & 490, has notes on the structure of the lower jaw of *Sphenodon*, which he considers as affording additional support to the opinion of the affinity between the *Rhynchocephalia* and the *Chelonia*.

*Champsosaurus*, Cope : amended diagnosis by DOLLO, *Ann. Soc. Brux.* xiv, p. 67 (1890).

*Homæosaurus major*, n. sp. (foss.), BOULENGER, *t. c.* p. 167, fig., Upper Jurassic, England and Hanover.

## ANOMODONTIA.

SEELEY, H. G. *Researches on the Structure, Organisation, and Classification of the Fossil Reptilia.* VII. Further Observations on *Pareiasaurus*. Abstract, *P. R. S.* xlix, pp. 518-520.

*Ptychosiaugum orientale*, Lyd. : notes on the pectoral and pelvic girdles and the skull ; LYDEKKER, *Rev. Geol. Surv. Ind.* xxiii (1890), p. 17, figs.

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## BATRACHIA.

- LEBRUN, H. Recherches sur l'appareil génital femelle de quelques Batraciens indigènes. *La Cellule*, vii, pp. 417-484, 6 pls.
- BURCKHARDT, R. Untersuchungen am Hirn und Geruchsorgan von *Triton* und *Ichthyophis*. *Z. wiss. Zool.* lii, pp. 369-403, pls. xxi & xxii.
- \*SEECK, O. Ueber die Hautdrüsen einiger Amphibien. Inaugural Dissertation. Dorpat: 1891, 8vo, 72 pp.
- AUERBACH, L. Ueber einen sexuellen Gegensatz in der Chromatophilie der Keimsubstanzen, nebst Bemerkungen zum Bau der Eier und Ovarien niederer Wirbelthiere. *SB. Ak. Berl.* 1891, pp. 331-368.
- SCHWINK, —. Untersuchungen über die Entwicklung der Endothele und der Blutkörperchen der Amphibien. *Morph. JB.* xvii, pp. 288-333, pls. xvii-xix.
- GÖPPERT, E. Die Entwicklung und das spätere Verhalten des Pankreas der Amphibien. *Morph. JB.* xvii, pp. 100-122, pl. vii.
- FIELD, H. H. The Development of the Pronephros and Segmental Duct in Amphibia. *Bull. Mus. C. Z.* xxi, pp. 201-340, pls. i-viii.
- GAGE, S. H. Combined aquatic and aerial respiration in Amphibia and the function of the external gills in Salamanders hatched on land. Abstract. *P. Am. Ass.* xxxix, p. 337.
- . Changes in the ciliated areas of the alimentary canal of the Amphibia during development, and the relation to the mode of respiration. Abstract. *T. c.* pp. 337 & 338.
- K. KNAUTHE, *Zool. Anz.* xiv, pp. 104-106 & 109-115, writes on the endurance of cold in the European Batrachians. W. MÜLLER-ERZBACH, *t. c.* pp. 383 & 384, remarks on the same subject.

## ECAUDATA.

- EMERY, O. Recherches sur la Morphologie du squelette des extrémités chez les Vertébrés terrestres. Notice préliminaire. I. Le Carpe et le Prépollex des Anoures. *Arch. Ital. Biol.* xv, pp. 421-425, fig.
- SCHUBERG, A. Ueber den Bau und die Funktion der Haftapparate des Laubfrosches. *Arb. Inst. Würzb.* x, pp. 57-118, pls. v & vi.
- . Ueber sogenannte "überzählige Phalangen" bei Amphibien. *T. c.* pp. 119-124.

The author is opposed to the view of the homology of the intercalary ossifications between the distal and penultimate phalanges of certain tailless Batrachians with true phalanges.

- PERRIN, —. Sur les muscles du pied de la *Rana*. *Bull. Soc. Philom.* (8) iii, pp. 16-20, fig.



CAMERANO, L. Recherches sur le développement et les causes du polymorphisme des têtards des Amphibies anoures. Arch. Ital. Biol. xv, pp. 165-177.

BATAILLON, E. Recherches anatomiques et expérimentales sur la Métamorphose des Amphibiens anoures. Ann. Univ. Lyon, ii, pp. 1-128, pls. i-vi.

\*RATNER, G. Zur Metamorphose des Darmes bei der Froschlärve. Inaug.-Diss. Dorpat: 1891, 8vo, 34 pp., 1 pl.

G. BRANDES, Biol. Centralbl. xi, pp. 73-78, remarks on A. Looss's experiments on the resorption of the tail in the Tadpoles [cf. Zool. Rec. xxvi, Rept. p. 20].

SHERWOOD & RYDER, Am. Nat. xxv, pp. 740-742, fig., remark upon Tadpoles of *Rana catesbiana*, with bifid reproduced tails.

R. BLANCHARD, Bull. Soc. Zool. xvi, p. 250, fig., describes and figures a monstrous (drosical) Tadpole of *Rana temporaria*.

MORGAN, T. H. Some notes on the Breeding Habits and Embryology of Frogs. Am. Nat. xxv, pp. 753-760.

Deals with the North American species.

CHIARUGI, G. Sur les myotomes et sur les nerfs de la tête postérieure et de la région proximale du tronc dans les embryons des Amphibiens anoures. Résumé. Arch. Ital. Biol. xv, pp. 229-239.

MACBRIDE, E. W. The development of the Oviduct in the Frog. P. Cambr. Phil. Soc. vii, pp. 148-151.

ERLANGER, R. VON. Zur Blastoporusfrage bei den anuren Amphibien. Anat. Anz. vi, pp. 684-686.

ABELOUS, J. E., & LANGLOIS, P. Recherches expérimentales sur les fonctions surrénales de la Grenouille. Arch. Phys. (5) iv, pp. 269-278.

BERNARD, H., & BRATUSCHEK, K. Der Nutzen der Schleimhüllen für die Froscheier. Biol. Centralbl. xi, pp. 691-694.

CONTEJEAN, C. Sur la digestion stomacale de la Grenouille. Bull. Soc. Philom. (8) iii, pp. 111-114.

BERTACCHINI, P. La Spermatogenesi nella *Rana temporaria*. Month. Int. J. Anat. Hist. viii, pp. 140-168, pls. ix & x.

HÉRON-ROYER, —. Nouveaux faits d'hybridation observés chez les Batraciens Anoures. Mém. Soc. Zool. iv, pp. 75-85.

On hybrids obtained from various European forms of *Hyla*, *Bufo*, and *Bombinator*.

## PHANEROGLOSSA.

### RANIDÆ.

*Rana esculenta*, L.: on the races of this species and their geographical distribution; BOULENGER, P. Z. S. 1891, p. 374. On an anomalous Tadpole; CAMERANO, Boll. Mus. Zool. Tor. vi, No. 106. L. VON MÉHELÝ

writes on the distribution of *R. temporaria*, *arvalis*, and *agilis* in Hungary; J. Ber. Ver. Magdeburg, 1890, p. 225. On *R. temporaria* and *arvalis* in Mecklenburg; M. BRAUN, Arch. Ver. Mecklenb. xliv, p. 41. WOLTERSTORFF, J. Ber. Ver. Magdeburg, 1890, p. 316, describes the nuptial garb of what he takes to be a male *R. agilis*, from near Agram [The Recorder has examined the specimen and pronounced it to be *R. arvalis*.—REC.]. *R. cantabrigensis*, Baird, remarks by BOULENGER, Ann. N. H. (6) viii, p. 453. *R. iberica*, Blgr., and *lutastii*, Blgr., redescribed; *id. t. c.* pp. 350 & 351. *R. clamata*, var. *guianensis*, Ptrs., = *R. palmipes*, Spix; *id. t. c.* p. 453. *R. decorata*, Mocq., = *R. luctuosa*, Ptrs.; BOULENGER, Ann. N. H. (6) vii, p. 341. *R. obsoleta*, Mocq., = *R. signata*, Gthr.; *id. t. c.* p. 342. *R. paradoxa*, Mocq., = *R. kuhlii*, Schleg.; *id. t. c.* p. 344. *R. whiteheadi*, Blgr., remarks; *id. t. c.* p. 344. *R. glandulosa*, Blgr., recorded from Malacca by BOULENGER, Ann. N. H. (6) viii, p. 291. *R. macularia*, var. *javanica*, Horst, = *R. nicobariensis*, Stol.; *id. ibid.*

*R. græca*, n. sp., *id. t. c.* p. 346, fig., Greece. *R. virgatipes*, n. sp., COPE, Am. Nat. xxv, p. 1017, New Jersey. *R. hosii*, n. sp., BOULENGER, Ann. N. H. (6) viii, p. 290, Borneo.

† *Crotaphitis* and *Baliopygus*, n. nn., for subdiv. of the genus *Rana*; ERWIN SCHULZE, J. Ber. Ver. Magdeburg, 1890, pp. 176 & 177.

*Staurois*, Cope: remarks by BOULENGER, Ann. N. H. (6) vii, p. 345. *Ixalus nubilus*, Mocq., = *I. natator*, Gthr.; *id. ibid.*

*Rhacophorus macrotis*, n. sp., *id. t. c.* p. 282, Borneo.

*Ixalus signatus*, Blgr., recorded from Ceylon by BOULENGER, *op. cit.* viii, p. 292. *I. travancoricus*, n. sp., *id. t. c.* p. 291, Travancore.

*Megalixalus pantherinus*, n. sp., STEINDACHNER, Anz. Ak. Wien, 1891, p. 142, and SB. Ak. Wien, c. i, p. 313, Plateau of Leikipia, E. Africa.

*Hylambates greshoffii*, n. sp., SCHILTHUIS, Tijdschr. Nederl. Dierk. Ver. (2) ii, p. 286, fig. [1889], Boma, Congo.

#### ENGYSTOMATIDÆ.

J. A. RYDER, Am. Nat. xxv, pp. 838–840, reports on the development of *Engystoma carolinense*.

*Engystoma rugosum*, D. & B., = *E. carolinense*, Holbr.; BOULENGER, Ann. N. H. (6) viii, p. 453.

#### CYSTIGNATHIDÆ.

*Hylodes*, Fitz.: WOLTERSTORFF, J. Ber. Ver. Magdeburg, 1890, p. 317, notices a Peruvian frog, probably of this genus, which dispenses with metamorphoses.

*Paludicola signifera*, Gir.: on its synonymy; BOULENGER, Ann. N. H. (6) viii, p. 454.

*Leptodactylus prognathus*, Blgr., recorded from Buenos Ayres by BOULENGER, *t. c.* p. 453. *Cystignathus hylodes*, R. & L., = *L. pentadactylus*, Laur., *id. t. c.* p. 455. *L. (Plectromantis) andicola*, n. sp., BOETTGER, Zool. Anz. xiv, p. 346, Bolivia.

*Borborocoetes miliaris*, Spix, described, and synonymy revised, by BOULENGER, Ann. N. H. (6) viii, p. 454.

*Crinia froggatti*, n. sp., FLETCHER, P. Linn. Soc. N.S.W. (2) vi, p. 275, Victoria.

#### BUFONIDÆ.

On the poisonous secretions of the Toad ; BRUNTON, The Lancet, 1891, ii, p. 522, and GUTHRIE, t. c.

*Bufo stomaticus*, Lützk., redescribed by BOULENGER, Ann. N. H. (6) vii, p. 463. *B. quadriporcatus*, Blgr., recorded from Borneo by BOULENGER, op. cit. viii, p. 292. *B.luetkenii*, n. sp., id. t. c. p. 455, Costa Rica. *B. surdus*, n. sp., id. op. cit. vii, p. 282, Baluchistan.

#### HYLIDÆ.

*Chorophilus triseriatus*, Wied, = *C. nigrilus*, Leconte ; HAY, P. Am. Ass. xxxix, p. 346.

*Hyla nana*, Blgr., recorded from Rio Grande do Sul, and *H. bivittata*, Blgr., from Parana, by BOULENGER, Ann. N. H. (6) viii, p. 456. *H. cærulea*, White, feeding on crabs [*Sesarma quadrata*] ; J. THALLWITZ, Zool. Gart. xxxii, p. 278.

*Hylella platycephala*, Cope, = *Exerodonta sumichrasti*, Brocchi ; BOULENGER, Ann. N. H. (6) viii, p. 456.

† *Tetraprion jordani*, n. g. & sp., STEJNEGER, P. U. S. Nat. Mus. xiv, p. 167, pl. viii, Ecuador : this is referred to *Diaglena*, Cope, by BOULENGER, Ann. N. H. (6) viii, p. 456.

#### PELOBATIDÆ.

SEWERTZOW, A. N. Ueber einige Eigenthümlichkeiten in der Entwicklung und im Bau des Schädels von *Pelobates fuscus*. Bull. Soc. Mosc. 1891, pp. 143-160, figs.

*Pelobates cultripes*, Cuv. : on the occasional presence of teeth on the parasphenoid and pterygoid bones ; BOULENGER, P. Z. S. 1890, p. 664.

*Pelodytes punctatus*, Daud. : on its distribution in the Seine-inférieure ; L. H. BOURGEOIS, Bull. Soc. Rouen, xxvi, p. 189.

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*Dolichosoma huxleyi*, n. sp., *id.* Cat. Foss. Mamm. &c., Science and Art. Mus., Dublin, p. 60, Coal Measures, Co. Kilkenny, Ireland.

✓*Notalacerta* and ✓*Notamphibia*, n. nn. for Batrachian footprints in the Upper Coal Measure Group of Kansas City, Missouri; E. BUTTS, Kansas Scient. v, pp. 18 & 44, figs. *Notalacerta missouriensis* and *jacksoniensis*, . 18, *Notamphibia magna*, p. 44, n. spp.

# PISCES.

BY

G. A. BOULENGER.

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The titles are distributed in the various parts of the Record of *Pisces*, which is arranged as follows, viz. :—

1. GENERAL, p. 1.
  2. FAUNISTIC, p. 4.
  3. PALÆONTOLOGICAL, p. 7.
  4. SYSTEMATIC, p. 9.
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## GENERAL.\*

A. S. WOODWARD, in the Introduction to the second volume of his Catalogue of Fossil Fishes (*infra*, p. 7), discusses the principal schemes of classifications hitherto propounded, and adopts a division of the Fishes (exclusive of the *Cyclostomata* and *Acrania*) into 5 subclasses, viz., ELASMOBRANCHII, HOLOCEPHALI, OSTRACODERMI, DIPNOI, and TELEOSTOMI. This arrangement is followed in the present report.

E. KOKEN, Z. geol. Ges. xliii, p. 154, has considerations on the bearing of the study of Otoliths to the natural classification of Fishes. From an assumed original type of organ of hearing the author derives three independent lines of evolution: 1. *Holocephali*, of which the *Dipnoi* are a further modification; 2. *Elasmobranchii*; 3. *Ganoidei* and *Teleostei*. The study of this organ does not support the view that the Clupeoids are derived from the group of which *Amia* is the living representative. The classification of the *Teleostei* into *Physostomi*, *Acanthopterygii*, &c., is criticized at some length, and found to be on the whole most artificial.

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\* An asterisk prefixed to a quotation indicates that the Recorder has not seen the journal or work referred to.

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The living Vertebrata, as classified by their urinogenital system, fall into two series: 1. The *Nephrochidic* (*Elasmobranchii*, *Batrachia*, *Amniota*), in which vasa efferentia are present, and the excretory organ is an accessory to reproduction in the male; 2. the *Euthorchidic* (*Ganoidei*, *Teleostei*, *Marsiprobanchii*, *Dipnoi*), in which vasa efferentia are unrepresented, and the Wolffian or segmental duct is exclusively renal in function. The author formulates the hypothesis of an apterygial (*i.e.*, without pectoral fins) Chondrichthyan, with hermaphrodite duct bearing genitalia, as the most probable ancestor of the living Vertebrata.

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II. *Pisces aquitanicorum schistorum*, pp. 67-91.

IIA. *Reliquiæ piscium e margaceo aquitanico ad Thermas — Varasdinenses*, pp. 91 & 92.

IIB. *Pisces fluviatilium schistorum ad Eibiswald, Leoben et Fohnsdorf*, pp. 92-95.

III. *Pisces schistorum mediterraneorum ad Brežani supra Vrabič*, pp. 96-98.

IV. *Pisces schistorum sarmaticorum ad Sused, Dolji, St. Nedelja et St. Simon prope Zagrabiam*, pp. 98-121.

V. *Pisces schistorum congericorum ad St. Xaverium*, pp. 121 & 122.

VI. *Pisces schistorum paludineorum ex Sclavonia*, pp. 122-124.

VII. *Reliquiæ piscium ex schistis tertiarii superioris [diluvialii?] ad Sofiam in Bulgaria*, pp. 124-126.

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E. D. COPE, Am. Nat. xxv, pp. 479-481, and P. U. S. Nat. Mus. xiv, pp. 459 & 460, remarks on his superorder *Rhipidopterygia*, which he divides into two orders: *Taxistia* and *Rhipidistia*. The three other superorders of the *Teleostomi*, or true fishes, are the *Crossopterygia*, the *Podopterygia*, and the *Actinopterygia*.

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*Pleuronectidæ*, *Gudidæ*, *Mugilidæ*, *Triglidæ*.

— Essai d'élevage de quelques Alevins. T. c. pp. 121-124.

*Mugil auratus* and *Sargus rondeletii*.

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## ACTINOPTERYGII.

## TELEOSTEI.

## ACANTHOPTERYGII.

## PERCIDÆ.

JORDAN, D. S., & EIGENMANN, C. H. A Review of the Genera and Species of *Serranidæ* found in the waters of America and Europe. Bull. U. S. Fish Comm. viii, pp. 329-441, pls. lxi-lxix.

P. P. C. HOEK reports, in the Dutch newspaper "Staats-Courant," June, 1890, on his investigations of the normally hermaphrodite *Percidæ* of the Gulf of Naples.

WILSON, H. V. On the Development of the Sea Bass (*Serranus atrarius*). Johns Hopk. Univ. Circ. ix, pp. 56-59, figs. (1890).

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*Lucioperca skorpili*, n. sp. (foss.), KRAMBERGER-GORJANOVIČ, Rad jugoslav. akad. cvi, p. 125, pl. viii, figs. 4-8, Upper Tertiary (Diluvium?) of Sofia, Bulgaria.

*Etheostoma micropterus*, n. sp., GILBERT, P. U. S. Nat. Mus. xiii, p. 289, Chihuahua, Mexico. *E. julia*, n. sp., MEEK, Bull. U. S. Fish Comm. ix, p. 130, pl. xlii, fig. 2, Missouri. *E. (Nothonotus) jordani*, n. sp., GILBERT, t. c. p. 156, pl. xliii, fig. 2, Alabama.

*Percichthys pocha*, Phil., described by JORDAN & EIGENMANN, t. c., p. 428, Curicó, Chili. *P. vinciguerræ*, n. sp., PERUGIA, Ann. Mus. Genov. (2) x, p. 610, Rio Sta. Cruz.

*Labrax latus*, p. 71, pl. iv, fig. 1, *mojsisovicsi*, p. 73, pl. iv, fig. 2, *elongatus*, p. 74, pl. v, figs. 1 & 2, and *sagorensis*, p. 77, pl. iv, figs. 3 & 4, n. spp. (foss.), KRAMBERGER-GORJANOVIČ, Rad jugoslav. akad. cvi, Cretaceous of Lesina.

*Etelis argyrogrammicus*, C. & V., pl. x, fig. 3, *filamentosus*, C. & V., pl. xi, fig. 2, *brevirostris*, C. & V., pl. x, fig. 2, and *zonatus*, C. & V., pl. xi, fig. 3, figured by SAUVAGE, Hist. Madag. xvi.

*Serranus nigripinnis*, C. & V., pl. ix, fig. 4, *erythræus*, C. & V., pl. x, fig. 1, *aurantius*, C. & V., pl. ix, fig. 5, *morrua*, C. & V., pl. vii, fig. 1, *retouti*, Blkr., pl. viii, fig. 2, *lutra*, C. & V., pl. vii, fig. 3, *cylindricus*, Gthr., pl. viii, fig. 1, *rivulatus*, C. & V., pl. vii, fig. 2, *polleni*, Blkr., pl. viii, fig. 3, and *leuogrammicus*, C. & V., pl. vii, fig. 4, figured by SAUVAGE, t. c. *S. oabrilla*, L., var. *bicolor*, Kossm. & Ramb., and *S. atricauda*, Gthr., notes by STEINDACHNER, SB. Ak. Wien, c. i, pp. 349 & 351. *S. simonyi*, n. sp., id. t. c. p. 352, pl. i, fig. 1, and Anz. Ak. Wien, 1891, p. 172, Canary Is. *S. castelnau*, n. n. for *Centropristis nebulosus*, Casteln. (nec *Serranus nebulosus*, C. & V.), JORDAN & EIGENMANN, t. c. p. 409.



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*Epinephelus costae*, Sldr.: note by BELLOTTI, Atti Soc. Ital. xxxiii, p. 119.

*Diplectrum sciurus*, n. sp., GILBERT, P. U. S. Nat. Mus. xiv, p. 550, Gulf of California.

*Mycteroperca jordani*, Jenk. & Everm., figured by EVERMANN & JENKINS, t. c. pl. i, fig. 2. *M. pardalis*, n. sp., GILBERT, t. c. p. 551, La Paz Bay, Lower California.

*Bodianus scanthistius*, n. sp., id. t. c. p. 552, Gulf of California.

√ *Gilbertia*, n. g., for *Plectropoma semicinctum*, C. & V.; JORDAN & EIGENMANN, t. c. p. 346.

*Lutjanus madras*, C. & V., pl. xii, fig. 4, and *griseoides*, Guich., pl. ix, fig. 3, figured by SAUVAGE, t. c.

*Diacope cœruleovittata*, C. & V., pl. xii, fig. 2, *calveti*, C. & V., pl. xii, fig. 1, *duodecim-lineata*, C. & V., pl. xiii, fig. 3, *bengalensis*, Bl., pl. xiii, fig. 1, *marginata*, C. & V., pl. xii, fig. 3, and *analis*, C. & V., pl. xiii, fig. 2, figured by SAUVAGE, t. c.

*Glyphodes aprionoides*, Guich., figured by SAUVAGE, t. c. pl. xi, fig. 1.

*Ambassis commersonii*, C. & V., figured; id. t. c. pl. xli a, fig. 6.

*Priacanthus speculum*, C. & V., pl. xiv, fig. 2, *macropus*, Q. & G., pl. xiv, fig. 1, *fax*, C. & V., pl. xvi, fig. 1, *alticlarens*, Val., pl. xvi, fig. 3, and *refulgens*, Val., pl. v, fig. 5, figured; id. t. c.

*Anthias squamipinnis*, Ptrs., fig. 1, and *borbonius*, C. & V., fig. 2, figured; id. t. c. pl. xvii.

*Apogon auritus*, C. & V., figured by SAUVAGE, t. c. pl. ix, fig. 2.

*Chilodipterus polyacanthus*, Vaill., figured; id. t. c. pl. xviii, fig. 2, pl. xxiv, fig. 6.

*Pikea lunulata*, Guich., figured; id. t. c. pl. xxii, fig. 1.

*Dules fuscus*, C. & V., pl. xv, fig. 4, *rupestris*, Lac., pl. xli b, fig. 3, and *caudivittatus*, Lac., pl. xviii, fig. 3, & pl. xxiv, fig. 5, figured by SAUVAGE, t. c.

*Therapon elongatus*, Guich., pl. ix, fig. 1, and *obtusirostris*, Guich., pl. xxviii, fig. 5, figured; id. t. c.

√ *Plagiogeneion*, n. g. for *Therapon rubiginosus*, Hutton. H. O. FORBES, Tr. N. Z. Inst. xxii, p. 273 (1890).

*Priacanthus serrula*, n. sp., GILBERT, P. U. S. Nat. Mus. xiii, p. 450, Tropical East Pacific.

*Pomatomus telescopium*, Risso, recorded from the W. Coast of Ireland by HOLT, Sci. P. R. Dubl. Soc. (2) vii, p. 121.

√ *Eurumetopos*, n. g., allied to *Oligorus*. Seven branchiostegals; single row of villiform teeth; the spinous dorsal continuous with the soft, and composed of nine spines; operculum with a soft, fleshy point; scales ctenoid. *E. johnstonii*, n. sp., A. MORTON, P. R. Soc. Tasm. f. 1887, p. 77, pl. (1888), Tasmania.

*Pristipoma anas*, Val., pl. xxviii, fig. 4, and *leucurum*, C. & V., pl. xxxii, fig. 1, figured by SAUVAGE, Hist. Madag. xvi.

*Diagramma centrurio*, C. & V., pl. xx, fig. 2, and *griseum*, C. & V., pl. xxiv, fig. 4, figured; id. *ibid*.

*Cæcio cæruleureus*, Lac., pl. xvi, fig. 2, and *cylindricus*, pl. vi, fig. 1, figured; SAUVAGE, Hist. Madag. xvi.

*Scolopsis frenatus*, C. & V., pl. xxviii, fig. 3, and *phæops*, Benu., pl. vi, fig. 2, figured; *id. ibid.*

*Synagris*, Gthr.: on the character of the lateral line; SAUVAGE, Bull. Soc. Zool. xvi, p. 185. *S. tolu*, C. & V., figured by SAUVAGE, Hist. Madag. xvi, pl. vii, fig. 5.

*Pentapus curtus*, Guich., fig. 2, and *dux*, Val., fig. 3, figured; *id. t. c.* pl. xxii.

*Lobotes surinamensis*, Bl, figured; *id. t. c.* pl. xii a, fig. 3.

*Gerres oyena*, Forsk., figured by SAUVAGE, Hist. Madag. xvi, pl. xxxvi a, fig. 2. *G. californiensis*, n. var. *cinereus*, R. S. EIGENMANN, Am. Nat. xxv, p. 155, San Diego, California.

*Hermosilla azurea*, Jenk. & Everm., figured by EVERMANN & JENKINS, P. U. S. Nat. Mus. xiv, pl. i, fig. 3.

*Otolithus (Dentex) nobilis*, p. 124, pl. viii, fig. 8, Oligocene; *O. (Serranus) noetlingi*, p. 124, pl. viii, fig. 1, Oligocene, *distinctus*, p. 125, pl. x, fig. 2, Oligocene; *O. (Percidarum) varians*, p. 125, Oligocene, *plebejus*, p. 126, pl. x, fig. 1, Oligocene, *frequens*, p. 126, pl. viii, fig. 4, Oligocene, *æqualis*, p. 127, fig., Miocene, *moguntinus*, p. 128, fig., Miocene, Germany: n. nn. (foss.), KOKEN, Z. geol. Ges. xliii.

#### SQUAMIPINNES.

GILL, T. The Characteristics of the Family of Scatophagoid Fishes. P. U. S. Nat. Mus. xiii, pp. 355-360.

*Chaetodon nigropunctatus*, Sauv., fig. 2, *nigripinnis*, Peters, fig. 4, *xanthurus*, Blkr., fig. 1, and *melanopterus*, Guich., fig. 3, figured by SAUVAGE, Hist. Madag. xvi, pl. xxix.

*Holacanthus chrysurus*, C. & V., pl. xxxiv, fig. 1, *zebra*, Liénard, pl. xxxii, fig. 2, *ignatius*, Playf., pl. xxx, *diacanthus*, Bodd., pl. xxxiii, fig. 3, *caudibicolor*, Liénard, pl. xxix, fig. 6, & pl. xxxiii, fig. 2, and *regine*, Liénard, pl. xxx v, fig. 2, figured by SAUVAGE, *t. c.*

#### MULLIDÆ.

*Upeneus fraterculus*, C. & V., pl. xxvii, fig. 3, *cyclostomus*, Lac., pl. xxvi, fig. 4, *chryserydros*, Lac., pl. xxvi, fig. 3, and *cyprinoides*, C. & V., figured by SAUVAGE, Hist. Madag. xvi. *U. xanthogrammus*, n. sp., GILBERT, P. U. S. Nat. Mus. xiv, p. 553, La Paz, Lower California. *U. rathbuni*, n. sp., EVERMANN & JENKINS, *t. c.* p. 158, pl. ii, fig. 4, Guaymas, Mexico.

*Upeneoides sulphureus*, C. & V., fig. 1, and *vittatus*, Forsk., fig. 2, figured by SAUVAGE, Hist. Madag. xvi, pl. xxvii.

#### SPARIDÆ.

*Cuntharus grandoculis*, C. & V., figured by SAUVAGE, Hist. Madag. xvi, pl. xx, fig. 3.

*Lethrinus microdon*, C. & V., pl. xxv, fig. 1, *olivaceus*, C. & V., pl. xxiii, fig. 3, *argenteus*, C. & V., pl. xxiii, fig. 2, *frenatus*, C. & V., pl. xxi, fig. 1, *variegatus*, C. & V., pl. xix, fig. 2, & pl. xxv, fig. 4, *semicinctus*, C. & V., pl. xix, fig. 3, *cœruleus*, C. & V., pl. xxi, fig. 3, *centurio*, C. & V., pl. xx, fig. 1, & pl. xxiv, fig. 3, *borbonicus*, C. & V., pl. xxi, fig. 2, *croceopterus*, C. & V., pl. xxiv, fig. 1, *striatus*, Playf., pl. xxiv, fig. 2, *mahsena*, Forsk., pl. xxv, fig. 2, and *mahsenoides*, Ehrenb., pl. xxv, fig. 3, figured; SAUVAGE, Hist. Madag. xvi.

*Chrysophrys bifasciata*, Forsk., pl. xx, fig. 5, *haffara*, Forsk., pl. xxv a, fig. 1, *hasta*, Bl., pl. xxv a, fig. 2, and *sarba*, Forsk., pl. xxv a, fig. 3, figured; *id. ibid.* *C. hertlei*, Kramb. (foss.); figured by KRAMBERGER-GORJANOVIĆ, Rad jugoslav. akad. cvi, pl. vii, fig. 1.

*Sparnodus inflatus*, n. sp. (foss.), KRAMBERGER-GORJANOVIĆ, *t. c.* p. 80, pl. v, fig. 4, Cretaceous of Lesina.

*Pimelepterus altipinnoides*, Guich., figured by SAUVAGE, Hist. Madag. xvi, pl. lix a, fig. 4.

*Otolithus (Sparidarum) gregarius*, n. n. (foss.), KOKEN, Z. geol. Ges. xliii, p. 129, pl. vii, figs. 7 & 8, Oligocene, Germany.

## CIRRHITIDÆ.

*Cirrhitès guichenoti*, Sauv., figured by SAUVAGE, Hist. Madag. xvi, pl. xxxiii, fig. 1.

*Chilodactylus mulhalli*, Macl. (= *Psilocranium coxii*, Macl.): notes by SAVILLE-KENT, P. R. Soc. Tasm. f. 1887, p. 42 (1888). *C. vizonarius*, n. sp., *id. t. c.* p. 48, Tasmania.

## SCORPÆNIDÆ.

*Sebastes bibrioni*, Sauv., = *S. dactylopterus*, Lac.; BELLOTTI, Atti Soc. Ital. xxxiii, p. 118.

*Sebastes proriger*, J. & S., p. 15, and *pinniger*, Gill, p. 16; notes by C. H. & R. S. EIGENMANN, P. Cal. Acad. (2) iii. *S. goodei*, p. 12, *rufus*, p. 13, *melanostomus*, p. 17, *eos*, p. 18, and *areus*, p. 20, and *serranoides*, p. 36, n. spp., *id. t. c.*, California. *S. gillii*, n. sp., R. S. EIGENMANN, Am. Nat. xxv, p. 154, Point Loma, California.

*Neosebastes scorpenoides*, Guich., figured by MCCOY, Prodr. Zool. Vict., Dec. xx, pl. cxciii (1890).

*Scorpena mauritiana*, C. & V., pl. xxxv, fig. 4, *erythræa*, C. & V., pl. xxxv, fig. 3, *rubro-punctata*, C. & V., pl. xxxv, fig. 5, *mossambica*, Ptrs., pl. xxxiii, fig. 1, and *megastoma*, Sauv., pl. xxxv, fig. 6; figured by SAUVAGE, Hist. Madag. xvi.

*Caracanthus mulagascariensis*, Guich., figured by SAUVAGE, *t. c.* pl. xxxv, fig. 8.

## NANDIDÆ.

*Trachinops caudimaculatus*, McCoy, figured by MCCOY, Prodr. Zool. Vict., Dec. xx, pl. cxciv (1890).

## 14 Pisces.

### PISCES.

#### TEUTHIDIDÆ.

*Teuthis abhortani*, C. & V., figured by SAUVAGE, Hist. Madag. xvi, pl. xxxv, fig. 7.

#### BERYCIDÆ.

*Beryx lineatus*, C. & V., figured by SAUVAGE, Hist. Madag. xvi, pl. iv, fig. 3.

*Myripristis seychellensis*, C. & V., pl. ii, fig. 1, & pl. iii, fig. 2, *kuntzei*, Russ., pl. iii, fig. 3, *pralinus*, C. & V., pl. ii, fig. 2, *axillaris*, C. & V., pl. ii, fig. 3, *murdjan*, Forsk., pl. ii, fig. 4, and *vittatus*, C. & V., pl. v, fig. 2, figured ; *id. t. c.*

*Holotrachys lima*, C. & V., pl. iii, fig. 1, and *archiepiscopus*, Val., pl. iv, fig. 2, figured ; *id. t. c.*

*Holocentrum leo*, C. & V., pl. ii, fig. 6, & pl. xv, fig. 3, *spiniferum*, Forsk., pl. iv, fig. 1, *diadema*, Lac., pl. ii, fig. 5, and *macropus*, Gthr., pl. vi, fig. 3, figured ; *id. t. c.*

*Hoplopteryx lundensis*, p. 417, pl. xliii, figs. 1-3, and *minor*, p. 421, pl. xlv, figs. 3 & 4, n. spp. (foss.), J. W. DAVIS, Tr. R. Dubl. Soc. (2) iv, Cretaceous formations of Sweden,

*Berycopsis lindstromi*, n. sp. (foss.), *id. t. c.* p. 422, pl. xliv, fig. 1, Cretaceous of Sweden.

*Otolithus (Hoplostethus) lawleyi*, p. 115, pl. ix, fig. 2, Pliocene, Italy, *pisanus*, p. 115, pl. ix, fig. 1, Pliocene, Italy, *nettelblatti*, p. 116, pl. ix, fig. 6, Oligocene, Germany, *ostiolatus*, p. 116, pl. ix, figs. 4 & 5, Oligocene, Germany ; *O. (Monocentris) subrotundus*, p. 118, Oligocene, Germany, *integer*, p. 119, Pliocene, Denmark, *hospes*, p. 119, Miocene, N. America ; *O. (Berycidarum) rhenanus*, p. 120, pl. vi, fig. 10, Miocene, Germany, *geron*, p. 120, pl. viii, fig. 5, & pl. ix, figs. 7 & 8, Oligocene, Germany, *parvulus*, p. 121, pl. x, figs. 4 & 5, Oligocene, Germany, *debilis*, p. 122, pl. vi, fig. 3, Miocene, Germany, *austriacus*, p. 122, figs., Transsylvania, and *neglectus*, p. 123, pl. x, fig. 16, Oligocene, Germany : n. nn. (foss.), KÖKEN, Z. geol. Ges. xliii.

#### KURTIDÆ.

*Pempheris macrolepis*, Maccl. : note on Tasmanian specimens ; A. MORTON, P. R. Soc. Tasm. f. 1887, p. 44 (1888).

#### POLYNEMIDÆ.

*Polynemus astrolabi*, Sauv., figured by SAUVAGE, Hist. Madag. xvi, pl. xxxvii, fig. 1.

#### SCIÆNIDÆ.

*Corvina dorsalis*, Ptrs., figured by SAUVAGE, Hist. Madag. xvi, pl. xvii, fig. 3.

*Otolithus (Sciæna) holsaticus*, p. 107, pl. vii, fig. 1, Miocene, Germany,

*speciosus*, p. 108, pl. vii, fig. 2, Oligocene, Germany, *meridionalis*, p. 109, Miocene, Italy, *kirschbergensis*, p. 109, Miocene, Germany, *irregularis*, p. 109, pl. viii, fig. 3, Oligocene and Miocene, Germany, *amplus*, p. 110, pl. vii, fig. 3, Oligocene, Germany, *obtusius*, p. 110, pl. vii, fig. 4, Oligocene, Germany; *O. (Corvina) gibberulus*, p. 111, pl. viii, fig. 7, Oligocene, Germany; *O. (Sciænidarum) ovatus*, p. 111, pl. vii, figs. 5 & 6, Oligocene, Germany, and *insignis*, p. 112, pl. x, fig. 11, Oligocene, Germany: n. nn. (foss.), KOKEN, Z. geol. Ges. xliii.

## XIPHIIDÆ.

*Histiophorus herschelli*, Gray: note on a Tasmanian specimen; R. M. JOHNSTON, P. R. Soc. Tasm. f. 1887, p. 45 (1888).

## TRICHIURIDÆ.

*Aphanopus simonyi*, n. sp., STEINDACHNER, Anz. Ak. Wien, 1891, p. 173, and SB. Ak. Wien, c. i, p. 356, Canary Is.

*Thyrstites lovisatoi*, n. sp. (foss.), BASSANI, Atti Acc. Nap. (2) iv, No. 3, p. 54, pl. i, fig. 5, & pl. ii, fig. 23, Tertiary of Sardinia.

✓*Bathysoma*, n. g., for *B. lutkeni*, n. sp. (foss.), J. W. DAVIS, Tr. R. Dubl. Soc. (2) iv, p. 424, & pl. xlv, figs. 1-7, Cretaceous of Sweden.

## ACRONURIDÆ.

*Acanthurus gaudryi*, n. sp. (foss.), DE ZIGNO, Mem. Ist. Venet. xxiii, p. 14, pl. i, fig. 2 (1890), Eocene, Monte Bolca.

✓*Apostasis*, n. g., allied to *Acanthurus*, KRAMBERGER-GORJANOVIČ, Rad jugoslav. akad. cvi, p. 104, for *Acanus sturi*, Kramb. (foss.), and *A. croaticus*, Kramb. (foss.). The latter figured, pl. iii, fig. 1.

## CARANGIDÆ.

*Caranx hippos*, L., pl. xii, fig. 2, *chrysophrys*, C. & V., pl. xxxi, fig. 4, and *forsteri*, C. & V., pl. xxxi, fig. 3, figured by SAUVAGE, Hist. Madag. xvi.

*Equula parviceps*, C. & V., figured by SAUVAGE, t. c. pl. xxxi, fig. 2.

*Psenes javanicus*, C. & V., figured; *id. t. c.* pl. xxxi, fig. 1.

*Seriolichthys indicus*, Val., figured by SAUVAGE, t. c. pl. xlix, fig. 3.

*Lichia alta*, n. sp. (foss.), KRAMBERGER-GORJANOVIČ, Rad jugoslav. akad. cvi, p. 82, pl. v, fig. 3, Cretaceous of Lesina.

*Proantigoniu octacantha*, Kramb. (foss.), figured by KRAMBERGER-GORJANOVIČ, t. c. pl. ii, fig. 1.

*Amphistium longipenne*, n. sp. (foss.), DE ZIGNO, Mem. Ist. Venet. xxiii, p. 12, pl. i, fig. 1 (1890), Eocene, Monte Bolca.

## CYTTIDÆ.

*Zeus hörnesi*, p. 86, pl. vi, figs. 1 & 2, and *robustus*, p. 88, pl. vi, fig. 3, n. spp. (foss.), KRAMBERGER-GORJANOVIČ, Rad jugoslav. akad. cvi.

## CORYPHÆNIDÆ.

*Astrodermus elegans*, Risso: remarks by BELLOTTI, Atti Soc. Ital. xxxiii, p. 122.

## SCOMBRIDÆ.

*Scomber scomber*, L.: on a hermaphrodite specimen; STEWART, J. L. S. xxiv, p. 70, pl. iii, fig. 2.

*Thynnus pelamys*, C. & V., recorded from the coast of California, by C. H. & R. S. EIGENMANN, P. Cal. Ac. Sci. (2) iii, p. 8.

*Scomber (Auxis) sarmaticus*, n. sp. (foss.), KRAMBERGER-GORJANOVIČ, Rad jugoslav. akad. cvi, p. 112, pl. viii, fig. 1, Schists of Sused and Dolje, Croatia.

*Elacate canada*, L.: on the occurrence of a young specimen in the Lower Hudson Valley, New York; A. K. FISHER, P. U. S. Nat. Mus. xiii, p. 195.

*Echeneis isodonta*, Guich., fig. 1, and *ranina*, Guich., fig. 2, figured by SAUVAGE, Hist. Madag. xvi, pl. xxxv.

## TRACHINIDÆ.

*Platycephalus scaber*, L., pl. xxxvi, fig. 1, *rodericensis*, C. & V., pl. xxxvi, fig. 2, *punctatus*, C. & V., pl. xxxvi, fig. 5, *borboniensis*, C. & V., pl. xxxvi, fig. 4, and *grandidieri*, Sauv., pl. xxxvi, fig. 3, figured by SAUVAGE, Hist. Madag. xvi.

*Lopholatilus chameleonticeps*, Goode & Bean, figured, with notes on its occurrence, by LUCAS, Rep. U. S. Nat. Mus. 1888-89, p. 647, pl.

*Notothenia macrocephalus*, Gthr., described from the Straits of Magellan, by PERUGIA, Ann. Mus. Genov. (2) x, p. 618.

*Otolithus (Trachinus) mutabilis*, p. 112, Oligocene, Germany, *verus*, p. 113, pl. x, figs. 13 & 14, Oligocene, Germany, and *seelandicus*, p. 113, figs., Eocene, Denmark: n. nn. (foss.), KOKEN, Z. geol. Ges. xliii.

## BATRACHIDÆ.

CLAPP, CORNELIA M. Some Points in the Development of the Toad-Fish (*Batrachus tau*). J. Morph. v, pp. 494-501, figs.

RYDER, J. A. The functions and histology of the yolk-sack of the young Toad-Fish (*Batrachus tau*). P. Ac. Philad. 1890, pp. 407 & 408.

*Batrachus uranoscopus*, Guich., figured by SAUVAGE, Hist. Madag. xvi, pl. xxxvii, fig. 2.

## PÆDICULATI.

GUITEL, F. Recherches sur la ligne latérale de la Baudroie (*Lophius piscatorius*). Arch. Z. expér. (2) ix, pp. 125-190, pls. vi-viii.

——. Recherches sur les Boutons nerveux bucco-pharyngiens de la Baudroie (*Lophius piscatorius*). T. c. pp. 671-697, pl. xxiv.



PRINCE, E. E. Notes on the Development of the Angler-Fish (*Lophius piscatorius*). Rep. Fish. Scotl. ix, pt. iii, pp. 343-348, pls. xiv & xv.

*Antennarius reticularis*, n. sp., GILBERT, P. U. S. Nat. Mus. xiv, p. 566, Gulf of California.

*Halieutaea nigra*, n. sp., ALCOCK, Ann. N. H. (6) viii, p. 24, Andaman Sea, 115-220 faths.

*Dibranchius nasutus*, p. 24, pl. vii, fig. 1, Andaman Sea, 188-200 faths., and *micropus*, p. 25, pl. vii, fig. 2, Bay of Bengal, 240-276 faths., n. spp., *id.*, t. c.

*Malthopsis*, n. g., as *Maltha*, but with only two gills on each side. *M. luteus*, n. sp., *id.* t. c. p. 26, Andaman Sea, 188-220 faths.

*Halimetus*, n. g. Head and anterior part of body very broad and depressed; front with a transverse bony bridge and a subrostral cavity lodging a fleshy tentacle; cleft of mouth horizontal; villiform teeth in jaws and palatines; gill-openings small; foramina situated superiorly in the axillæ; two gills; no pseudobranchiæ; head and body with close-set graniform asperities and large granular tubercles; no dorsal fin whatever; anal fin very short; pyloric appendages and air-bladder absent. *H. ruber*, n. sp., *id.* t. c. p. 27, pl. viii, fig. 1, Andaman Sea, 188-220 faths.

*Histioccephalus*, n. g. (*Pediculatorum*?), DE ZIGNO, Mem. Ist. Venet. xxiii, p. 29. *H. bassanii*, n. sp. (foss.), *id.* t. c. p. 31, pl. i, fig. 9, Eocene, Monte Bolca.

#### COTTIDÆ.

GILL, T. The Osteological Characteristics of the Family *Hemitriptera*dæ. P. U. S. Nat. Mus. xiii, pp. 377-380, pl. xxxi.

*Cottus scorpius*, L., and *quadricornis*, L., figured by SUNDMAN, Finlands Fiskar, pt. x, pls. xxviii & xxix. *C. nivosus*, n. sp., HERZENSTEIN, Mém. biol. xiii, p. 113 (1890), Sinus St. Olgæ, Siberia. *C. beldingii*, n. sp., C. H. & R. S. EIGENMANN, Am. Nat. xxv, p. 1132, Lake Tahoe, California.

*Cottunculus thomsonii*, Gthr., (= *C. torvus*, Goode): notes by LÜTKEN, Vid. Medd. 1891, p. 28.

*Gillellus ornatus*, n. sp., GILBERT, P. U. S. Nat. Mus. xiv, p. 558, Gulf of California.

*Centridermichthys alcicornis*, n. sp., HERZENSTEIN, Mém. biol. xiii, p. 115, Yesso, Japan.

*Rhynchocottus richardsonii*, Gthr., noticed and figured by A. H. GREEN, Pap. N. H. Soc. Brit. Columb. i, p. 59, pl.

*Prionotus gymnotethus*, n. sp., GILBERT, P. U. S. Nat. Mus. xiv, p. 559, Gulf of California.

*Otolithus* (*Trigla*) *ellipticus*, p. 130, fig., and *adjunctus*, p. 131, pl. x, fig. 9: n. nn. (foss.), KOKEN, Z. geol. Ges. xliii, Oligocene, Germany.

## CATAPHRACTI.

*Hypsagonus gradiens*, n. sp., HERZENSTEIN, Mém. biol. xiii, p. 116 (1890), Kamtschatka.

*Otolithus* (P. *Agonus*) *primas*, p. 131, *O. (Peristedion) personatus*, p. 132, pl. x, fig. 6 : n. nn. (foss.), KOKEN, Z. geol. Ges. xliii, Oligocene, Germany.

## DISCOBOLI.

GILL, T. On the Relations of Cyclopteroidea. P. U. S. Nat. Mus. xiii, pp. 361-376, pls. xxviii-xxx.

GUI TEL, F. Sur le développement des nageoires paires du *Cyclopterus lumpus*. C.R. cxii, pp. 353-356, fig.

*Paraliparis cephalus*, p. 561, and *mento*, p. 562, n. spp., GILBERT, P. U. S. Nat. Mus. xiv, Coast of California and Oregon.

*Careproctus melanurus*, n. sp., *id. t. c.* p. 560, Coast of California and Oregon.

## GOBIIDÆ.

PRINCE, E. E. Some Features in the Egg and Larva of the Skeelpin (*Callionymus lyra*). Rep. Fish. Scotl. ix, pt. iii, pp. 349-351, pl. xiii, figs. 10-13.

GUNNINGHAM, J. T. The Egg and Larva of *Callionymus lyra*. J. Mar. Biol. Ass. (2) ii, pp. 89 & 90, pl. v.

*Gobius*, L. : on the eggs and breeding habits of the Danish species ; PETERSEN, Vid. Medd. 1891, p. 243, pl. iv & v. *G. minutus*, L. : note on the habits ; GUI TEL, C.R. cxiii, p. 292 ; transl. in Ann. N. H. (6) viii, pp. 407-409. *G. amiciensis*, C. & V., pl. xli, fig. 3, *vergeri*, Blkr., pl. xxxix, fig. 4, *sambiranoensis*, Blkr., pl. xxxix, fig. 5, *capistratus*, Ptrs., pl. xxxviii, fig. 5, *obscurus*, Ptrs., pl. xxxviii, fig. 2, *brevifilis*, C. & V., pl. xli, fig. 2, *auchenotenia*, Blkr., pl. xxxix, fig. 3, *albopunctatus*, C. & V., pl. xxxviii, fig. 3, *signatus*, Ptrs., pl. xxxviii, fig. 4, *giuris*, Ham. Buch., pl. xxxvii, fig. 3, *simplex*, Sauv., pl. xli, fig. 4, *hypselosoma*, Blkr., pl. xxxix, fig. 6, *polyzona*, Blkr., pl. xl, fig. 3, *isognathus*, Blkr., pl. xl, fig. 1, *macrorhynchus*, Blkr., pl. xxxix, fig. 7, *madagascariensis*, Blkr., pl. xl, fig. 4, *ocellatus*, Brouss., pl. xl, fig. 2, and *banana*, C. & V., pl. xxxviii, fig. 1, figured by SAUVAGE, Hist. Madag. xvi. *G. zanzibarensis*, n. sp., *id. t. c.* p. 365, pl. xli, fig. 1, Zanzibar. *G. macrolepis*, n. sp., SCHARFF, P. R. Irish Ac. (3) i, p. 458, fig., S.W. Coast of Ireland. *G. microdon*, n. sp., GILBERT, P. U. S. Nat. Mus. xiv, p. 554, West Coast of Mexico. *G. brevis*, Ag. (foss.), figured by KRAMBERGER-GORJANOVIČ, Rad jugoslav. akad. cvi, pl. vii, fig. 3.

*Clevelandia*, Eigenm., is not identical with *Gillichthys* ; C. H. & R. S. EIGENMANN, P. Cal. Ac. Sci. (2) iii, p. 11.

*Gillichthys y-cauda*, Jenk. & Everm., is referred to *Lepidogobius* ; *id. t. c.* p. 11.

*Bollmannia*, Jord. : synopsis of the species, by GILBERT, P. U. S. Nat. Mus. xiv, p. 555. *B. ocellata*, p. 555, *macropoma*, p. 556, and *stigmatura*, p. 556, n. spp., *id. ibid.*, Gulf of California.

✓ *Gobiosoma crescentalis*, n. sp., *id. t. c.* p. 557, Gulf of California.

*Chrioilepis*, n. g., closely related to *Gymneleotris*, Blkr., but differing in the total absence of scales, and the absence of enlarged canines in the front of the mandible; *id. t. c.* p. 557. *C. minutillus*, n. sp., *id. t. c.* p. 558, Gulf of California.

† *Tarletonbeania*, n. g., allied to *Myctophum*, differing from related genera in having no externally developed lateral line; C. H. & R. S. EIGENMANN, *t. c.* p. 6. *T. tenua*, n. sp., *id. t. c.* p. 7, San Diego, California.

*Gobiodon coryphænula*, C. & V., figured by SAUVAGE, Hist. Madag. pl. xlix b, fig. 1.

*Sicydium laticeps*, C. & V., figured; *id. t. c.* pl. xlvii, fig. 5.

*Eleotris madagascariensis*, C. & V., pl. xviii, fig. 1, & pl. xli a, fig. 4, *ophiocephalus*, C. & V., pl. xxxviii, fig. 8, & pl. xli a, fig. 3, *butis*, Ham. Buch., pl. xli a, fig. 2, *lantzii*, Thomin, pl. xli, fig. 6, and *fusca*, Bl., pl. xli a, fig. 1, figured by SAUVAGE, *t. c.*

*Callionymus calauropomus*, Rich., figured by MCCOY, Prodr. Zool. Vict., Dec. xx, pl. cxcii (1890).

*Crystallogobius nilssonii*, Düb. & Kor., recorded from the W. Coast of Ireland by HOLT, Sci. P. R. Dubl. Soc. (2) vii, p. 121, and from the S.W. Coast of England by CUNNINGHAM, J. Mar. Biol. Ass. (2) ii, p. 158.

*Aphia pellucida*, Nardo, recorded from the W. Coast of Ireland by HOLT, *t. c.* p. 121.

*Otolithus (Gobius) francofurtanus*, p. 132, pl. vi, fig. 7, *vicinalis*, p. 133, and *dispar*, p. 133, pl. x, fig. 12 : n. nn. (foss.), KOKEN, Z. geol. Ges. xliii, Miocene, Germany.

### BLENNIIDÆ.

*Blennius fossilis*, n. sp. (foss.), KRAMBERGER-GORJANOVIČ, Rad jugoslav. akad. cvi, p. 113, pl. iii, fig. 3, Schists of Dolje, Croatia.

*Chirolophus polyactocephalus*, Pall., described and figured by A. H. GREEN, Pap. N. H. Soc. Brit. Columb. i, p. 55, pl. *C. japonicus*, n. sp., HERZENSTEIN, Mém. biol. xiii, p. 123 (1890), Jāpan.

*Petroscirtes barbatus*, Ptrs., figured by SAUVAGE, Hist. Madag. xvi, pl. xxxviii, fig. 6.

*Salarias striatus*, C. & V., pl. xli, fig. 8, *oryx*, Ehrenb., pl. xli, fig. 9, *meleagris*, C. & V., pl. xxxviii, fig. 7, *frenatus*, C. & V., pl. xli a, fig. 5, *castaneus*, C. & V., pl. xli, fig. 7, and *kirkii*, Gthr., pl. xxvi, fig. 1, figured; *id. ibid.*

*Alticus monochrous*, Blkr., figured; *id. t. c.* pl. xxxix, figs. 1 & 2.

*Stichæus grigorjewi* and *dictyogrammus*, n. spp., HERZENSTEIN, Mém. biol. xiii, pp. 119 & 121 (1890), Japan.

*Cristiceps wilsoni*, p. 10, pl. iii, fig. 1, and *philippi*, p. 11, pl. iii, fig. 2, n. spp., LUCAS, P. R. Soc. Vict. (2) iii, Victoria.

*Tripterygium macleayanum*, n. sp., *id. t. c.* p. 12, pl. iii, fig. 4, Victoria.  
*T. clarkei*, n. sp., A. MORTON, P. R. Soc. Tasm. f. 1887, p. 78 (1888), Tasmania.

*Auchenopterus asper*, Jenk. & Everm., figured by EVERMANN & JENKINS, P. U. S. Nat. Mus. xiv, p. 163, pl. ii, fig. 6.

† *Dialonmus*, n. g., with the eye as in *Anableps*, the cornea divided by an oblique pigmented band into an anterior lower and a posterior upper half. *D. fuscus*, n. sp., GILBERT, *op. cit.* xiii, p. 452, Galapagos Is.

#### SPHYRÆNIDÆ.

*Sphyræna bocagei*, n. sp., OSORIO, J. Sci. Lisb. (2) ii, p. 114, Gulf of Guinea.

#### ATHERINIDÆ.

*Atherina hepsetus*, L.: on its reproduction; MARION, Ann. Mus. Marseille, iv, p. 93, pl. i, figs. 1-3. *A. parvipinnis*, C. & V., figured by SAUVAGE, Hist. Madag. xvi, pl. xliii, fig. 3. *A. sarmatica*, n. sp. (foss.), KRAMBERGER-GORJANOVIĆ, Rad jugoslav. akad. cvi, p. 116, pl. iii, fig. 2, Schists of Dolje, Croatia.

*Eleotris sikoræ*, n. sp., SAUVAGE, Hist. Madag. xvi, p. 521, pl. xlv c, fig. 2, Madagascar. [Is an *Atherina*.—REC.]

*Atherinops insularum*, n. sp., GILBERT, P. U. S. Nat. Mus. xiv, p. 549, Gulf of California.

*Atherinichthys vomerina*, C. & V. (?), described by PERUGIA, Ann. Mus. Genov. (2) x, p. 621.

*Menidia clara*, n. sp., EVERMANN & JENKINS, P. U. S. Nat. Mus. xiv, p. 136, Guaymas, Mexico.

#### MUGILIDÆ.

*Mugil borbonicus*, C. & V., pl. xlii, fig. 3, *carinatus*, C. & V., pl. xlii, fig. 1, *axillaris*, C. & V., pl. xliii, fig. 1, *cæruleomaculatus*, Lac., pl. xliii, fig. 2, *rodericensis*, Gthr., pl. xlii, fig. 4, *smithii*, Gthr., pl. xli a, fig. 4, *robustus*, Gthr., pl. xli a, fig. 6, *waigiensis*, Q. & G., pl. xli b, fig. 5, and *cephalotus*, C. & V., pl. xlix, figs. 2 & 3, figured by SAUVAGE, Hist. Madag. xvi. *M. setosus*, n. sp., GILBERT, P. U. S. Nat. Mus. xiv, p. 549, Gulf of California.

*Agonostoma*, Benn.: notes on the habits, and on the proposed introduction in the United States; BEAN, Bull. U. S. Fish Comm. viii, p. 443. *A. dobuloides*, C. & V., figured; SAUVAGE, Hist. Madag. xvi, pl. xlii, fig. 5.

*Myzus cæcutiens*, Gthr., figured; *id. t. c.* pl. xlii, fig. 2.

#### CENTRISCIDÆ.

† *Aulorhamphus*, n. g., for *Oulamostoma bolcensis*, Sldr. (foss.); DE ZIGNO, Mem. Ist. Venet. xxiii, p. 19 (1890). *A. bolcensis*, described and figured, p. 20, pl. i, fig. 4. *A. capellini*, n. sp. (foss.), *id. t. c.* p. 23, pl. i, fig. 5, Eocene, Monte Bolca.

## TRACHYPTERIDÆ.

*Regalecus grillii*, Lindr. : note by H. O. FORBES, N. Z. J. Sci. i, p. 154.  
*R. argenteus*, Parker : on a specimen from New Zealand ; KINGSLEY, Tr.  
 N. Z. Inst. xxii (1890), p. 333, pl. xx.

## ACANTHOPTERYGII PHARYNGOGNATHI.

## POMACENTRIDÆ.

*Pomacentrus pristiger*, C. & V., fig. 4, *littoralis*, C. & V., fig. 2, and  
*madagascariensis*, Sauv., fig. 3, figured by SAUVAGE, Hist. Madag. xvi,  
 pl. xlvi. *P. grandidieri*, n. sp., STEINDACHNER, Anz. Ak. Wien, 1891,  
 p. 174, and SB. Ak. Wien, c. i, p. 372, pl. ii, fig. 3, Madagascar. *P.*  
*leucurus*, n. sp., GILBERT, P. U. S. Nat. Mus. xiv, p. 554, Socorro I.,  
 W. coast of Mexico.

*Heliastes frenatus*, C. & V., fig. 1, and *cinerascens*, C. & V., fig. 2,  
 figured by SAUVAGE, Hist. Madag. xvi, pl. xxviii.

## LABRIDÆ.

JORDAN, D. S. A Review of the Labroid Fishes of America and Europe.  
 Rep. U. S. Fish. Comm. f. 1887, pp. 559-699, pls. i-xi.

*Pseudolabrus*, Blkr. : remarks by GILL, and list of the species ; P. U. S.  
 Nat. Mus. xiv, p. 395.

*Symphodus doderleini*, n. n. for *Crenilabrus tinca*, C. & V., nec L. ; JOR-  
 DAN, Rep. U. S. Fish. Comm. f. 1887, p. 618.

*Labrus (Crenilabrus) woodwardi*, n. sp. (foss.), KRAMBERGER-GORJA-  
 NOVIČ, Rad jugoslav. akad. cvi, p. 119, pl. ii, fig. 4, Schists of Dolje, Croatia.

*Crenilabrus szajnochae*, n. sp. (foss.), DE ZIGNO, Mem. Ist. Venet. xxiii,  
 p. 17, pl. i, fig. 3 (1890), Eocene, Monte Bolca.

*Ctenolabrus adspersus*, Walb., figured by JORDAN, Rep. U. S. Fish.  
 Comm. 1887, pl. i.

*Hiatula onitis*, L., figured ; *id. t. c.* pl. ii.

*Lachnolæmus maximus*, Walb., figured ; *id. t. c.* pl. iii.

*Trochocopus pulcher*, Ayres, figured ; *id. t. c.* pl. iv.

*Labrichthys ceruleus*, Douglas-Ogilby, recorded from Tasmania by  
 SAVILLE-KENT, P. R. Soc. Tasm. f. 1887, p. 47 (1888).

*Cossyphus spilotes*, Guich., figured by SAUVAGE, Hist. Madag. xvi,  
 pl. xxxii, fig. 3.

*Pseudocheilinus hexatenia*, Blkr., figured ; *id. t. c.* pl. xlib, fig. 2.

*Anampses viridis*, C. & V., figured ; *id. t. c.* pl. xlv, fig. 3.

*Xyrichtys novacula*, L., figured by JORDAN, Rep. U. S. Fish. Comm. f.  
 1887, pls. viii & x. *X. venustus*, Poey, p. 200, *psittacus*, L., p. 202, described ;  
*X. vertralis*, p. 198, pl. xxix, fig. 1, and *infirmus*, p. 199, pl. xxix, fig. 2,  
 n. spp. : BEAN, Bull. U. S. Fish. Comm. viii, Yucatan.

*Novacula immaculata*, C. & V., figured by SAUVAGE, *t. c.* pl. xlv, fig. 2

*Coris doliata*, Lac, figured ; *id. t. c.* pl. xlix, fig. 5.

*Halichoeres bivittatus*, Bl., figured by JORDAN, *t. c.* pls. v & vi.

*Pseudojulis venustus*, Jenk. & Everm., figured by EVERMANN & JENKINS, P. U. S. Nat. Mus. xiv, p. 160, pl. ii, fig. 5.

*Julis newtoni*, n. sp., OSORIO, J. Sci. Lisb. (2) ii, p. 127, Gulf of Guinea.

*Scarus guacamaia*, Cuv., figured by JORDAN, Rep. U. S. Fish. Comm. f. 1887, pl. xi. *S. acutus*, Poey : notes by BEAN, Bull. U. S. Fish. Comm. viii, p. 197. *S. cuzamila*, n. sp., BEAN, t. c. p. 196, pl. xxix, fig. 4, Yucatan.

*Cryptoptomus beryllinius*, Jord. & Sw., figured; *id. t. c.* pl. ix.

*Sparisoma hoplomystax*, Cope, figured; *id. t. c.* pl. x.

*Pseudoscarus cyanescens*, C. & V., figured by SAUVAGE, t. c. pl. xlvi, fig. 5.

### EMBIOTOCIDÆ.

The name *Ditremitæ* is proposed to replace that of *Embiotocidæ*; C. H. & R. S. EIGENMANN, P. Cal. Ac. Sci. (2) iii, p. 9.

EIGENMANN, C. H. On the Precocious Segregation of the Sex-Cells in *Micrometrus aggregatus*, Gibbons. J. Morph. v, pp. 481-492, pl. xxxi.

*Amphistichus rhodoterus*, Ag. : notes by C. H. & R. S. EIGENMANN, P. Cal. Ac. Sci. (2) iii, p. 9.

### CHROMIDES.

H. E. SAUVAGE, Bull. Soc. Z. Fr. xvi, pp. 190-197, has notes on the freshwater *Chromides* of Madagascar.

*Paracara typus*, Blkr., figured by SAUVAGE, Hist. Madag. xvi, pl. xlixa, fig. 8, & pl. xlive, fig. 1.

*Ptychochromis oligacanthus*, Blkr., pl. xlv, fig. 1, pl. xlixa, fig. 4, & pl. xlixb, fig. 1, and *grandidieri*, Sauv., pl. xlv, fig. 3, & xlixa, fig. 5, figured; *id. t. c.* *P. madagascariensis*, n. sp., *id. t. c.* p. 442, pl. xliii, fig. 4, & pl. xlixa, fig. 6, Madagascar.

*Paratilapia polleni*, Blkr., pl. xlv, fig. 2, & xlixa, fig. 9, and *bleekeri*, Sauv., pl. xlv, fig. 1, & pl. xlixa, fig. 10, figured; *id. t. c.*

*Paretroplus damii*, Blkr., pl. xlvi, fig. 1, and *polyactis*, Blkr., pl. xlixa, fig. 7, & pl. xlixb, fig. 2, figured; *id. t. c.*

*Geophagus balzanii*, n. sp., PERUGIA, Ann. Mus. Genov. (2) x, p. 623, Rio Paraguay, Matto Grosso.

†*Lamprologus*, n. g. Each jaw with a front series of awl-shaped teeth, behind which is a rather broad band of very small teeth; anal spines 6-7; body compressed, oblong; scales ctenoid; cheeks, as well as the other parts of the head, scaleless; base of caudal fin scaly; dorsal spines numerous; spinous and soft portions of the dorsal continuous. *L. congolensis*, n. sp., SCHILTHUIS, Tijdschr. Nederl. Dierk. Ver. (2) iii, p. 85, pl. vi, fig. 1, Congo.

## ANACANTHINI.

## LYCODIDÆ.

*Lycodes diapterus*, n. sp., GILBERT, P. U. S. Nat. Mus. xiv, p. 564, off the coasts of California and Oregon, 82-376 faths.

## GADIDÆ.

BEATTIE, J. M. On the Anatomy of the Red Cod (*Lotella bacchus*). Tr. N. Z. Inst. xxiii, pp. 71-83, pls. xii-xv.

SMITH, W. R. A Case of Hermaphroditism in a Haddock (*Gadus æglefinus*). Rep. Fish. Scotl. ix, pt. iii, p. 352, fig.

*Gadus morrhua*, L. : on a hermaphrodite specimen ; HOWES, J. L. S. xxiii, p. 539, pl. xiv. *G. esmarkii*, Nilss., recorded from the W. coast of Ireland by HOLT, Sci. P. R. Dubl. Soc. (2) vii, p. 122.

*Merlangus vernalis*, Risso, = *Gadus poutassou*, Risso ; BELLOTTI, Atti Soc. Ital. xxxiii, p. 129.

*Morrhua minima*, Kramb. (foss.), figured by KRAMBERGER-GORJANOVIČ, Rad jugoslav. akad. cvi, pl. vii, fig. 5.

*Eleginus*, G. Fischer, = *Tilesia*, Swains., = *Pleurogadus*, Bean ; GILL, P. U. S. Nat. Mus. xiv, p. 303.

*Porogadus promelas*, n. sp., GILBERT, t. c. p. 546, Gulf of California, 1005 faths.

*Mora mediterranea*, Risso, recorded from the W. coast of Ireland by HOLT, Sci. P. R. Dubl. Soc. (2) vii, p. 122.

*Physiculus roseus*, n. sp., ALCOCK, Ann. N. H. (6) viii, p. 28, Andaman Sea, 188-200 faths.

*Salilota bovei*, n. sp., PERUGIA, Ann. Mus. Genov. (2) x, p. 626, Brecknock Pass, Magellan Straits.

*Onos guttatus*, Coll., redescribed by STEINDACHNER, SB. Ak. Wien, c. i, p. 360.

*Otolithus* (*Merluccius*) *attenuatus*, p. 84, pl. ii, figs. 1 & 2, Oligocene, Germany, *obtusius*, p. 85, pl. ii, figs. 3-5, Oligocene, Germany, *miocenicus*, p. 85, pl. v, fig. 4, Miocene, Germany ; *O. (Raniceps) latisulcatus*, p. 86, pls. iii, fig. 2, & pl. iv, fig. 4, Oligocene, Germany, *spatulatus*, p. 89, pl. ii, figs. 6, 7, & 10, Oligocene, Germany ; *O. (Merlangus) cognatus*, p. 89, pl. iii, fig. 5, and pl. v, fig. 1, Miocene, Germany, *suffolkensis*, p. 90, pl. v, fig. 5, Pliocene, Suffolk ; *O. (Gadidarum) ponderosus*, p. 90, figs., Pliocene, Copenhagen ; *O. (Gadus) venustus*, p. 91, pl. v, figs. 2 & 3, Miocene, Germany, *simplex*, p. 91, pl. iii, fig. 6, Oligocene, Germany, *tenuis*, p. 92, pl. iv, figs. 3 & 6, Miocene, France and Germany, *spectabilis*, p. 94, pl. iii, figs. 3 & 4, Miocene, Germany ; *O. (Morrhua) söllingenensis*, p. 94, pl. iii, fig. 1, Oligocene, Germany, *latus*, p. 95, pl. x, figs. 7 & 8, Miocene, Germany : n. nn. (foss.), KOKEN, Z. geol. Ges. xliii.

## OPHIDIIDÆ.

*Saccogaster maculata*, Alc. : notes by ALCOCK, P. Z. S. 1891, p. 226, fig.

*Dermatorus melanocephalus*, n. sp., *id. t. c.* p. 32, Bay of Bengal, 1644–1748 faths.

↓ *Lamprogrammus*, n. g. Lateral line with much enlarged scales, each of which bears a glandular luminous organ ; no ventral fins ; *id. t. c.* p. 32. *L. niger*, n. sp., *id. t. c.* p. 33, fig., Bay of Bengal, 405–561 faths.

*Saccogaster maculata*, Alcock, figured by ALCOCK, Ann. N. H. (6) viii, pl. vii, fig. 3.

*Paradicrolene nigricaudis*, n. sp., *id. t. c.* p. 30, Andaman Sea, 188–220 faths.

*Nemophis lessonii*, Kaup, figured by SAUVAGE, Hist. Madag. xvi, pl. xlvii, fig. 6.

*Fierasfer caninus*, Gthr., figured by SAUVAGE, *t. c.* pl. xlvii, fig. 1.

*Otolithus (Fierasfer) nuntius*, p. 99, pl. vi, fig. 2, *posterus*, p. 100, pl. vi, fig. 6 ; *O. (Ophidiidarum) bættgeri*, p. 100, pl. i, fig. 6, *obotritus*, p. 100, pl. i, fig. 5, *difformis*, p. 101, pl. i, fig. 7, pl. v, fig. 7, & pl. vi, fig. 5, *hilgendorfi*, p. 103, pl. v, fig. 14, *occultus*, p. 104, pl. vi, fig. 1, *marchicus*, p. 104, pl. x, fig. 18, *hybridus*, p. 105, pl. x, fig. 17, and *saxonicus*, p. 105, pl. x, fig. 19 : n. nn. (foss.), KOKEN, Z. geol. Ges. xliii, Oligocene, Germany.

## MACKURIDÆ.

*Macrurus rupestris*, Gunn., and *M. æqualis*, Gthr., recorded from the W. coast of Ireland by HOLT, Sci. P. R. Dubl. Soc. (2) vii, p. 122. *M. quadri-cristatus*, p. 119, and *petersonii*, p. 121, n. spp., ALCOCK, Ann. N. H. (6) viii, Andaman Sea, 188–220 faths. *M. (Malucocephalus) pectoralis*, n. sp., GILBERT, P. U. S. Nat. Mus. xiv, p. 563, off the coast of Oregon, 685–877 faths.

*Trachyrhynchus helolepis*, n. sp., *id. t. c.* p. 562, West Coast of Central America.

*Otolithus (Macrurus) præcursor*, p. 96, figs., Pliocene, Italy, and *singularis*, p. 98, pl. vi, fig. 9, Oligocene, Germany : n. nn. (foss.), KOKEN, Z. geol. Ges. xliii.

## ATELOPODIDÆ.

*Ateleopus indicus*, n. sp., ALCOCK, Ann. N. H. (6) viii, p. 123, fig., Andaman Sea, 188–220 faths.

## PLEURONECTIDÆ.

CUNNINGHAM, J. T. Flat Fishes. Rep. Plym. Inst. xi, pp. 30–42, pl.

—. An Experiment concerning the Absence of Colour from the lower Sides of Flat-Fishes. Zool. Anz. xiv, pp. 27–32, fig.

Experiment on young *Pleuronectes flesus*, with the object of elucidating the relation of the pigmentation of flat-fishes to the action of light.



FULLARTON, J. H. On the Development of the Plaice (*Pleuronectes platessa*). Rep. Fish. Scotl. ix, pt. iii, pp. 311-316, pls. vii-ix.

*Hippoglossus grigorjewi*, n. sp., HERZENSTEIN, Mél. biol. xiii, p. 134, Japan.

*Hippoglossina stomata*, n. sp., C. H. & R. S. EIGENMANN, P. Cal. Ac. Sci. (2) iii, p. 22, San Diego, California.

*Eopsetta jordani*, Lock. ? : note by C. H. & R. S. EIGENMANN, *l. c.* p. 23.

*Pleuronectes scutifer*, Steind., = *Platessa bicolorata*, Basil. ; HERZENSTEIN, Mél. biol. xiii, p. 133. *Pleuronectes obscurus* and *japonicus*, n. spp., *id. l. c.* pp. 127 & 130, Japan.

*Citharichthys platophrys*, n. sp., GILBERT, P. U. S. Nat. Mus. xiii, p. 454, Tropical East Pacific.

*Symphurus fasciolaris*, n. sp., *id. op. cit.* xiv, p. 566, Gulf of California.

*Aphoristia septemstriata*, n. sp., ALCOCK, Ann. N. H. (6) viii, p. 125, Andaman Sea, 188-220 faths.

*Otolithus* (*Platessa*) *sector*, p. 105, pl. i, fig. 4, *O. (Solea) guestfulticus*, p. 106, pl. v, fig. 10, *approximatus*, p. 106, pl. v, fig. 13, *O. (Pleuronectidarum) acuminatus*, p. 107, pl. v, fig. 2, *O. (? Rhombus) rhenanus*, p. 107, pl. v, fig. 11 : n. nn. (foss.), KOKEN, Z. geol. Ges. xliii, Oligocene and Miocene, Germany.

### PHYSOSTOMI.

E. KOKEN, SB. nat. Fr. 1891, pp. 25-27, regards Günther's order *Physostomi* as a most unnatural assemblage, and the Siluroids and Cyprinoids as more nearly related to each other than to the other families with which they are usually associated.

### SILURIDÆ.

WEBER, M. Eigenthümliche Lagerung der Leber und Niere bei Siluroiden. Zoolog. Ergebn. einer Reise in Nied. Ost-Ind. i. (Leyden : 1891), pp. 355-364, pl. xx.

GILL, T. Note on the *Aspredinidæ*. P. U. S. Nat. Mus. xiii, pp. 347-352.

*Plotosus anguillaris*, Bl., figured by SAUVAGE, Hist. Madag. xvi, pl. xlvii a, fig. 1.

*Phago boulengeri*, n. sp., SCHILTHUIS, Tijdschr. Nederl. Dierk. Ver. (2) iii, p. 90, Congo.

† *Diastatomycter*, n. g., resembling *Hemisilurus*, Blkr., but with a pair of mandibular barbels, and the posterior nostrils very large, spiracle-like, and situated in the temporal region. *D. chaperi*, n. sp., VAILLANT, Bull. Soc. Philom. (8) iii, p. 182, Bornéo.

*Noturus funebris*, n. sp., GILBERT & SWAIN, Bull. U. S. Fish Comm. ix, p. 153, Alabama.

*Ictalurus dugesii* : on the supposed poison-apparatus ; ALEMAN, Nat. Mex. (2) i, p. 498, fig.

1891. [VOL. XXVIII.]

*Pimelodus (Pimelodella) nigribarbis*, Blgr., redescribed and figured by BOULENGER, P. Z. S. 1891, p. 232, pl. xxv, fig. 1. *P. (P.) eigenmanni*, n. n. for *P. buckleyi*, Eigenm., nec Blgr.; *id. t. c.* p. 232. *P. (Pseudopimelodus) cottoides*, n. sp., *id. t. c.* p. 233, pl. xxv, fig. 2, Rio Grande do Sul. *P. argenteus*, p. 631, Plate R. and Parana, and *spiegazzinii*, p. 632, R. Durango, n. spp., PERUGIA, Ann. Mus. Genov. (2) x.

*Laimunema borbonica*, Sauv., figured by SAUVAGE, *t. c.* pl. xlvi, fig. 1.

*Ancharius fuscus*, Stdr., figured by SAUVAGE, *t. c.* pl. xlvii a, fig. 2.

*Galeichthys feliceps*, Smith: the eggs are carried by the male in the buccal cavity; BOULENGER, P. Z. S. 1891, p. 148.

*Atopochilus guentheri*, n. sp., SCHILTHUIS, Tijdschr. Nederl. Dierk. Ver. (2) iii, p. 86, pl. vi, fig. 2, Congo.

*Synodontis greshoffii*, *angelica*, and *alberti*, n. spp., *id. t. c.* pp. 87 & 88, Congo.

*Cyclopium cyclopum*, Humb.: remarks by F. DAY, in Whymper's Supp. App. to Trav. Andes of Ecuador, p. 137, who concludes to the identity of *Arges brachycephalus*, Gthr., and *Stygogenes humboldtii*, Gthr., with the fish described by Humboldt. The fish figured is *Arges whymperi*, Blgr.

*Chaetostomus cirrhosus*, Val: heads of male and female figured by BOULENGER, P. Z. S. 1891, pl. xxvi, fig. 1. *C. aculeatus*, n. sp., PERUGIA, Ann. Mus. Genov. (2) x, p. 637, R. Paraguay.

*Exostoma oschanini*, n. sp., HERZENSTEIN, Bull. Pétersb. (2) i, p. 119 (1889), Turkestan.

*Bunocephalus iheringii*, n. sp., BOULENGER, P. Z. S. 1891, p. 235, pl. xxvi, fig. 2, Rio Grande do Sul.

*Otocinclus nigricauda*, n. sp., *id. t. c.* p. 234, pl. xxv, fig. 3, Rio Grande do Sul.

*Trichomycterus minutus*, n. sp., *id. t. c.* p. 235, pl. xxvi, fig. 3, Rio Grande do Sul.

*Acanthopoma*, n. g., allied to *Stegophilus*. *A. annectens*, n. sp., LÜTKEN, Vid. Medd. 1891, p. 53, fig., Brazil.

*Otolithus (Arius) crassus* (= *Raia similis*, A. S. Woodw.), p. 80, Eocene, England, *germanicus*, p. 81, pl. i, fig. 3, & pl. vi, fig. 8, Oligocene, Germany, *danicus*, p. 81, fig., Eocene, Denmark, and *vangionis*, p. 81, pl. vi, fig. 4, Oligocene, Germany: n. nn. (foss.), KÖKEN, Z. geol. Ges. xliii.

#### SCOPELIDÆ.

On the Scandinavian species; LÜTKEN, Vid. Medd. 1891, pp. 203-233.

*Scopelus pseudocrocodilus*, Moreau, = *S. elongatus*, Costa; BELLOTTI, Atti Soc. Ital. xxxiii, p. 132. *S. bonaparti*, C. & V., = *S. maderensis*, Lowe; *id. t. c.* p. 135.

*Myctophum regale*, n. sp., GILBERT, P. U. S. Nat. Mus. xiv, p. 544, Gulf of California, 603-822 faths. *M. (Stenobranchius) leucopsarum*, n. sp., C. H. & R. S. EIGENMANN, P. Cal. Ac. Sci. (2) iii, p. 5, San Diego.

*Diaphus*, n. g., characters of *Myctophum*, but the phosphorescent spots divided into halves by a median black line; C. H. & R. S. EIGENMANN, *t. c.* p. 3; for *Scopelus engraulis*, Gthr., and *Diaphus theta*, n. sp., *id. t. c.* p. 4, San Diego, California.

✓ *Catblemella*, n. g., for *Notoscopelus brachychir*, Eigenm. ; *id. t. c.* p. 24.  
*Argyropelecus aculeatus*, C. & V., figured by SAUVAGE, Hist. Madag. xvi,  
 pl. xlviii, fig. 5.

*Paralepis*, Risso : remarks on the Mediterranean species ; BELLOTTI,  
 Atti Soc. Ital. xxxiii, p. 136.

*Harpodon squamosus*, n. sp., ALCOCK, Ann. N. H. (6) viii, p. 127, Bay  
 of Bengal, 240–276 faths.

## CYPRINIDÆ.

SAGEMEHL, M. Beiträge zur vergleichenden Anatomie der Fische. iv.  
 Das Cranium der Cyprinoiden. Morph. JB. xvii, pp. 489–595, pls.  
 xxviii & xxix.

K. KNAUTHE, Zool. Anz. xiv, pp. 73–76, has biological notes on  
 German Cyprinoids, and, pp. 104–106 & 109–115, on the effects of frost  
 on these fishes.

K. KNAUTHE, *t. c.* p. 258, records hybrids obtained by him between  
*Gobio fluviatilis* and *Leuciscus phoxinus*, and between the former and  
*Nemachilus barbatulus*. He also describes, *t. c.* pp. 259–264, some  
 anomalies in the fin-rays of German Cyprinoids, and, pp. 410 & 416,  
 albinos of *Leucaspius delineatus* and *Gobio fluviatilis*.

*Catostomus rex*, n. sp., R. S. EIGENMANN, Am. Nat. xxv, p. 667, Oregon.

*Xyrauchen cypho*, Lock., and *uncompahgre*, Jord. & Everm. : notes and  
 figures by JORDAN, Bull. U. S. Fish Comm. ix, p. 26, pl. iv, fig. 11, &  
 pl. v, fig. 12.

*Schizopygopsis*, Stdr. The genus monographed by HERZENSTEIN,  
 Przewalski Reise, Fische, p. 181. *S. severzowi*, p. 196, pl. xvi, fig. 2,  
 Pamir, *malacanthus*, p. 201, pl. xxiii, fig. 1, Sources of the Yang-tse-kiang,  
*thermalis*, p. 204, pl. xxiii, fig. 2, Tan-la, *kosłowi*, p. 208 pl. xv, fig. 2,  
 Zaidam and Upper Yang-tse, *guentheri*, p. 212, pl. xxiv, figs. 1 & 2, Zai-  
 dam, Alak-Nor, and Upper Yang-tse, *kessleri*, p. 217, pl. xxvi, fig. 1,  
 Zaidam, and *microcephalus*, p. 219, pl. xv, fig. 1, Sources of the Yang-tse,  
 n. spp., *id. t. c.*

✓ *Chuanchia*, n. g., near *Schizopygopsis* ; *id. t. c.* p. 223. *C. labiosa*, n. sp.,  
*id. t. c.* p. 224, pl. xvii, fig. 1, Chuanche, 13,600 feet.

✓ *Platypharodon*, n. g., intermediate between *Schizopygopsis* and *Gymno-*  
*cypris* ; *id. t. c.* p. 226. *P. extremus*, p. 229, pl. xxii, fig. 2, and *pewsowi*,  
 p. 231, n. spp., *id. t. c.*, Chuanche.

*Gymnocypris*, Gthr. The genus monographed by HERZENSTEIN, *op. cit.*  
 p. 234. *G. roborowskii*, p. 240, pl. xxi, fig. 1, Kuku-Nor, *eckloni*,  
 p. 243, pl. xxv, fig. 1, E. Thibet, *gasterolepidus*, p. 247, Chuanche, *leptoce-*  
*phalus*, p. 249, pl. xxii, fig. 1, Kuku-Nor, *maculatus*, p. 253, pl. xvii,  
 fig. 2, & pl. xxi, fig. 2, E. Thibet, and *potanini*, p. 258, pl. xxv, fig. 2, Blue  
 River, n. spp., *id. t. c.*

*Gobio fluviatilis*, Cuv. : on variations in the form of the head in the  
 young ; KNAUTHE, Zool. Anz. xiv, p. 59.

*Leuciscus*, Cuv. : note on the generic name ; JORDAN, Bull. U. S. Fish. Comm. ix, p. 20. *L. eibiswaldensis*, n. sp. (foss.), KRAMBERGEN-GORJANOVIĆ, Rad jugoslav. akad. cvi, p. 93, pl. vii, fig. 2, Aquitanian Schist of Eibiswald, Styria. *L. racalmuti*, n. sp. (foss.), POLLINI, Atti Soc. Ligust. ii, p. 119, Miocene of Sicily.

*Phoxinus (Tigoma) orcuttii*, n. sp., C. H. & R. S. EIGENMANN, P. Cal. Ac. Sci. (2) iii, p. 2, San Diego, California.

*Agosia yarrowi*, n. sp., JORDAN & EVERMANN, Bull. U. S. Fish. Comm. ix, p. 28, Upper Colorado Basin. *A. adobe*, n. sp., *id.* t. c. p. 36, Sevier River, Utah.

*Notropis scylla*, Cope : note by JORDAN, t. c. p. 16. *N. umbratilis fasciolaris*, n. subsp., GILBERT, t. c. p. 148, Alabama. *N. ozarcanus*, n. sp., MEEK, t. c. p. 129, Missouri. *N. telescopus arcansanus*, n. var., *id.* t. c. p. 133, Arkansas. *N. atherinoides caddonis*, n. var., *id.* t. c. p. 136, Arkansas.

*Opsopœodus bollmani*, n. sp., GILBERT, Bull. U. S. Fish. Comm. viii, p. 226, Georgia.

*Abramis blicca*, Bl. : on a specimen without pelvic fins ; H. H. BRINDLEY, P. Z. S. 1891, p. 108, pl. x.

*Alburnus charusinii*, Herz., redescribed and figured by HERZENSTEIN, Mém. biol. xiii, p. 136, woodcut.

*Leucaspis delineatus*, Sieb. : note on habits ; KNAUTH, Zool. Gart. xxxii, p. 145.

*Nemachilus kuschakewitschi*, n. sp., HERZENSTEIN, Mém. biol. xiii, p. 139, Turkestan.

### CHARACINIDÆ.

*Xiphorhamphus jenynsii*, Gthr., and *hepsetus*, Cuv. : notes by STEINDACHNER, SB. Ak. Wien, c. i, p. 371, pl. i, figs. 2 & 3.

*Distichodus antonii* and *lusosso*, n. sp., SCHILTHUIS, Tijdschr. Nederl. Dierk. Ver. (2) iii, pp. 89 & 90, Congo.

*Tetragonopterus nigripinnis*, p. 643, Plate River, and *lineatus*, p. 644, Matto Grosso, River Paraguay, n. spp., PERUGIA, Ann. Mus. Genov. (2) x. *T. lineatus*, pp. 173 & 368, pl. ii, fig. 1, Amazon, and *anomalus*, pp. 173 & 369, pl. iii, Rio Parana, n. sp., STEINDACHNER, Anz. Ak. Wien, 1891, and SB. Ak. Wien, c. i.

† *Pseudocorynopoma*, n. g., allied to *Chalcinus*, but with very high dorsal fin in the posterior half of the body ; PERUGIA, Ann. Mus. Genov. (2) x, p. 646 [April, 1891]. = *Bergia*, n. g., STEINDACHNER, Anz. Ak. Wien, 1891, p. 173 [July], and SB. Ak. Wien, c. i, p. 365. *P. doriae*, n. sp., PERUGIA, t. c. fig., La Plata. *B. allipinnis*, n. sp., STEINDACHNER, *tt. cc.* pp. 173 & 366, pl. ii, fig. 2, Montevideo. [The Recorder regards these species as identical.]

*Piabuca argentina*, L., and *spilurus*, Gthr. : notes by STEINDACHNER, SB. Ak. Wien, c. i, pp. 364 & 365.

## CYPRINODONTIDÆ.

*Haplochilus homalonotus*, A. Dum., pl. xlvii, fig. 2, and *nuchimaculatus*, Guich., pl. xlii, fig. 1, figured by SAUVAGE, Hist. Madag. xvi. *H. balzanii*, n. sp., PERUGIA, Ann. Mus. Genov. (2) x, p. 653, Matto Grosso, River Paraguay.

*Fundulus albolineatus*, n. sp., GILBERT, Bull. U. S. Fish. Comm. ix, p. 149, pl. xliii, fig. 1, Alabama.

*Zygionectes macdonaldi*, n. sp., MEEK, t. c. pp. 122 & 127, pl. xlii, fig. 1, Missouri.

## SCOMBRESOCIDÆ.

*Belone acus*, Risso, is the young of *B. vulgaris*, C. & V., BELLOTTI, Atti Soc. Ital. xxxiii, p. 131.

*Blochius macropterus*, n. sp. (foss.), DE ZIGNO, Mem. Ist. Venet. xxiii, p. 25, pl. i, fig. 7, Eocene, Monte Bolca.

*Exocoetus furcatus*, Mitch., (= *E. procne*, De Fil. & Verany): note on a specimen from Rapallo, Italy; CAMERANO, Boll. Mus. Zool. Anat. Comp. Torino, vi, No. 109. *E. solandri*, C. & V., figured by SAUVAGE, Hist. Madag. xvi, pl. xlix, fig. 4. *E. lineatus*, Val., redescribed by STEINDACHNER, SB. Ak. Wien, c. i, p. 362.

## MORMYRIDÆ.

On the electric organ; G. FRITSCH, SB. Ak. Berlin, 1891, pp. 439-460, figs.

*Mormyrus greshoffii*, p. 90, pl. vi, fig. 3, *M. (Mormyrops) swanenburgii*, p. 91, and *M. (M.) maria*, p. 92, n. spp., SCHILTHUIS, Tijdschr. Nederl. Dierk. Ver. (2) iii, Congo.

## STOMIATIDÆ.

*Stomias elongatus*, n. sp., ALCOCK, Ann. N. H. (6) viii, p. 129, Laccadive Sea, 738 faths.

## SALMONIDÆ.

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BEAN, T. H. Report on the Salmon and Salmon Rivers of Alaska, with Notes on the Conditions, Methods, and Needs of the Salmon Fisheries. Bull. U. S. Fish Comm. ix, pp. 165-208, with plates and maps.

SAVILLE-KENT, W. Observations on the Acclimatisation of the true Salmon (*Salmo salar*) in Tasmanian Waters, and upon the reported Salmon Disease at the Breeding Establishment on the River Plenty. P. R. Soc. Tasm. f. 1887, pp. 54-66 (1888).

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BLANC, H. Sur la maturation et la fécondation de l'œuf de la truite des lacs. *Arch. Sci. Nat.* (3) xxvi, pp. 575 & 576.

CANNIEU, A. Sur l'évolution sexuelle des Truites des Pyrénées. *C.R.* cxii, pp. 957-959.

*Salmo mykiss*, Walb. : notes on the varieties of this fish ; JORDAN, Bull. U. S. Fish Comm. ix, pp. 11, 28, & 34, pls. i-iii, & pl. iv, fig. 10. *S. fario*, L. : on a hermaphrodite specimen ; STEWART, J. L. S. xxiv, p. 69, pl. iii, fig. 1. *S. salvelinus* : on variations in Central European specimens ; HILGENDORF, SB. nat. Fr. 1891, p. 28. *S. (P) immigratus*, n. sp. (foss.), KRAMBERGER-GORJANOVIČ, Rad jugoslav. akad. cvi, p. 102, pl. vii, fig. 4, Schists of St. Nedelja, Croatia.

*Coregonus tullibee biselli*, n. subsp., BOLLMAN, Bull. U. S. Fish Comm. viii, p. 223, Michigan.

*Argentina sphyrena*, L., recorded from the W. Coast of Ireland, by HOLT, Sci. P. R. Dubl. Soc. (2) vii, p. 122.

#### CLUPEIDÆ.

RIDEWOOD, W. G. The Air-Bladder and Ear of British Clupeoid Fishes. *J. Anat. Phys.* (2) vi, pp. 26-42, figs.

CUNNINGHAM, J. T. The Reproduction and Growth of the Pilchard. *J. Mar. Biol. Ass.* (2) ii, pp. 151-157, pl. x.

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*Engraulis encrasicolus*, L. : on its occurrence in Scottish waters ; EWART, P. Phys. Soc. Edinb. 1889-90, p. 333. *E. polynemoides*, Gthr., fig. 2, and *boelama*, Forsk., pl. xlix, fig. 1, figured by SAUVAGE, Hist. Madag. xvi. *E. japonicus*, Schleg., is distinct from *E. ringens*, Jen. ; REUVENS, Notes Leyd. Mus. xiii, p. 176.

*Stolephorus cultratus*, n. sp., GILBERT, P. U. S. Nat. Mus. xiv, p. 544, Gulf of California.

*Olupea sprattus*, L., and *C. harengus*, var. *membras*, L., figured by SUNDMAN, Finlands Fiskar, pt. x, pl. xxx. *C. lundgreni*, n. sp. (foss.), J. W. DAVIS, Tr. R. Dubl. Soc. (2) iv, p. 427, pl. xlv, fig. 5, Cretaceous of Sweden.

*Harengula melanura*, C. & V., fig. 4, and *spilura*, Guich., fig. 3, figured by SAUVAGE, Hist. Madag. xvi, pl. xlvii.

*Spratelloides madagascariensis*, Sauv., figured; *id. t. c.* pl. xlviii, fig. 2.

*Elops saurus*, L., figured by SAUVAGE, *t. c.* pl. xlix *b*, fig. 4.

*Megalops cyprinoides*, Brouss., figured by SAUVAGE, *t. c.* pl. xlix *a*, fig. 3.

*Perkinsia*, n. g., allied to *Etrumeus*, for *P. othonops*, n. sp.; R. S. EIGENMANN, Am. Nat. xxv, p. 153, Point Loma, California.

*Hemiclopopsis gibbus*, Kramb. (foss.), figured by KRAMBERGER-GORJANOVIČ, Rad jugoslav. akad. cvi, pl. viii, fig. 3.

✓ *Bathyclupea*, n. g., referred to the *Clupeidae*, but differing from all *Physostomi* in the jugular ventrals; ALCOCK, Ann. N. H. (6) viii, p. 130. *B. hoskynii*, n. sp., *id. t. c.* p. 131, fig., Andaman Sea, 188–220 faths.

*Otolithus (Clupea) testis*, n. n. (foss.); KOKEN, Z. geol. Ges. xliii, p. 82, pl. i, figs. 1 & 2, Oligocene, Germany.

#### HOPLOPLEURIDÆ.

*Dercetis limhamnensis*, n. sp. (foss.), J. W. DAVIS, Tr. R. Dubl. Soc. (2) iv, p. 431, pl. xlv, figs. 1 & 2, Cretaceous of Sweden.

#### ALEPOCEPHALIDÆ.

*Aulastomatomorpha phospherops*, Alcock, figured by ALCOCK, Ann. N. H. (6) vii, p. 10.

*Alepocephalus bicolor*, n. sp., *id. op. cit.* viii, p. 133, Bay of Bengal, 240–276 faths. *A. tenebrosus*, n. sp., GILBERT, P. U. S. Nat. Mus. xiv, p. 545, Gulf of California, 359–822 faths.

#### MURÆNIDÆ.

CUNNINGHAM, J. T. On the Reproduction and Development of the Conger. J. Mar. Biol. Ass. (2) ii, pp. 16–42.

FRASER, J. E. Notes on the Spawning of the *Anguilla*. Rep. Brit. Ass. 1890, p. 866.

*Anguilla delalandii*, Kaup, pl. i, fig. 6, and *hildebrandti*, Pters., pl. xlix *a*, fig. 1, figured by SAUVAGE, Hist. Madag. xvi.

*Conger marginatus*, Val., figured by SAUVAGE, *t. c.* pl. xlix *a*, fig. 2.

✓ *Xenomystax*, n. g., allied to *Murænoæ*, but differing in the structure of the jaws and in the dentition. *X. atrarius*, n. sp., GILBERT, P. U. S. Nat. Mus. xiv, p. 348, Tropical East Pacific, 401 faths.

*Ophisoma*, Swains.: synopsis of the species; *id. t. c.* p. 349. *O. prorigerum*, p. 350, Tropical East Pacific, 401 faths., and *macrum*, p. 351, Gulf of California, n. spp., *id. ibid.*

✓ *Nettophichthys*, n. g., intermediate between *Nettastoma*, Raf., and *Saurenhelys*, Pters.; HOLT, Sci. P. R. Dubl. Soc. (2) vii, p. 122. *N. retro-pinnatus*, n. sp., *id. t. c.* p. 123, W. Coast of Ireland, 144 faths.

*Gavialiceps tæniola*, Alcock, is referred to *Nettastoma*; ALCOCK, Ann. N. H. (6) viii, p. 135.

*Callechelys peninsulae*, n. sp., GILBERT, P. U. S. Nat. Mus. xiv, p. 548, Gulf of California.

*Chlopsis equatorialis*, n. sp., *id. t. c.* p. 347, off the Coast of Ecuador, 401 faths.

*Dsyomma bucephalus*, Alcock, figured by ALCOCK, Ann. N. H. (6) viii, p. 137.

*Dsyommopsis*, n. g., allied to *Dsyomma*. *D. muciparus*, n. sp., *id. t. c.* p. 137, Bay of Bengal, 240–276 faths.

*Ilyophis*, n. g., considered provisionally as the type of a distinct family (*Ilyophidae*), combining characters of *Synaphobranchus* and *Simenchelys*; GILBERT, P. U. S. Nat. Mus. xiv, p. 351. *I. brunneus*, n. sp., *id. t. c.* p. 352, Pacific Ocean, near Chatham I., Galapagos, 634 faths.

*Ophichthys fuscus*, Zuiew, pl. xlix c, fig. 4, and *orientalis*, McCl., pl. xlix b, fig. 5, and pl. xlix c, fig. 3, figured by SAUVAGE, Hist. Madag. xvi.

*Gymnothorax mauritiana*, figured by SAUVAGE, *t. c.* pl. xlix c, fig. 2.

## LOPHOBRANCHII.

*Solenostomus bleekeri*, A. Dum., figured by SAUVAGE, Hist. Madag. xvi, pl. 1, fig. 1.

*Siphostoma carinatum*, n. sp., GILBERT, P. U. S. Nat. Mus. xiv, p. 547, Gulf of California.

*Syngnathus coquerelii*, A. Dum., figured by SAUVAGE, *t. c.* pl. 1, fig. 3. *S. microchirus*, n. sp., E. MOREAU, Bull. Soc. Z. Fr. xvi, p. 187, fresh-water, Corsica. *S. phillipi*, n. sp., LUCAS, P. R. Soc. Viet. (2) iii, p. 12, Victoria. *S. affinis*, n. sp. (foss.), KRAMBERGER-GORJANOVIĆ, Rad jugoslav. akad. cvi, p. 99, pl. iii, fig. 4, Schists of Dolje, near Zagrab, Croatia. *S. bolcensis*, n. sp. (foss.), DE ZIGNO, Mem. Ist. Venet. xxiii, p. 24, pl. i, fig. 6, Eocene, Monte Bolca.

*Hemithylacus liaspis*, Blkr., figured by SAUVAGE, *t. c.* pl. 1, fig. 5.

*Coelonotus vaillanti*, Juill., figured; *id. t. c.* pl. xlix b, fig. 6.

*Penetopterus tæniocephalus*, Lunel, figured; *id. t. c.* pl. xlix b, fig. 7.

*Stigmatophora argus*, Rich., n. var. *brevicaudata*; LUCAS, P. R. Soc. Viet. (2) iii, p. 14, Victoria.

*Hippocampus borboniensis*, A. Dum., figured by SAUVAGE, *t. c.* pl. 1, fig. 2.

## PLECTOGNATHI.

HALLER, B. Ueber das Centralnervensystem, insbesondere über das Rückenmark von *Orthagoriscus mola*. Morph. JB. xvii, pp. 198–270, figs., pls. xiii–xv.

*Monacanthus freycineti*, Cuv., figured by SAUVAGE, Hist. Madag. xvi, pl. xlix c, fig. 1.

*Ostracion bicaudalis*, L., figured by BEAN, Bull. U. S. Fish. Comm. viii, pl. xxviii.



*Tetrodon altipinnis*, n. sp., DOUGLAS-OGILBY, Rec. Austral. Mus. i, p. 110, Lord Howe I. *T. pygmaeus*, n. sp. (foss.), DE ZIGNO, Mem. Ist. Venet. xxiii, p. 27, pl. i, fig. 8, Eocene, Monte Bolca.

*Diodon*, L. On the Italian fossil species: PORTIS, Boll. Com. Geol. 1889, pp. 352-380, pl. x. *D. gigantodus*, p. 358, *meristodus*, p. 365, *platyodus*, p. 367, *rovasendæ*, p. 371, and *stenodus*, p. 376, n. spp., *id. ibid.*

*Chilomycterus californiensis*, n. sp., EIGENMANN, Am. Nat. xxv, p. 1133, San Pedro, California.

### INCERTÆ SEDIS.

*Otolithus* (*inc. sedis*) *lunabergensis*, p. 137, fig., *gallinus*, p. 138, fig., *hassovicus*, p. 138, pl. x, fig. 15, and *fallax*, p. 139, pl. x, fig. 3: n. nu. (foss.), KOKEN, Z. geol. Ges. xliii, Oligocene, Germany.

### GANOIDEI.

SEMON, R. Notizen über den Zusammenhang der Harn- und Geschlechtsorgane bei den Ganoiden. Morph. JB. xvii, pp. 623-635, pl. xxxi.

HOPKINS, G. S. Structure of the Stomach of *Amia calva*. P. Am. Micr. Soc. xii, pp. 165-169, figs. Abstract. P. Am. Ass. xxxix, p. 339.

A. S. WOODWARD, P. Z. S. 1890, p. 635, remarks on the evolution of the *Aspidorhynchidæ*.

*Apateopholis*, n. g. (*Aspidorhynchidarum*) for *Rhinellus laniatus*, J. W. Davis (foss.); A. S. WOODWARD, *t. c.* p. 634, with notes on and figure of the type specimen, *t. c.* pl. lv, fig. 11.

*Parathrissops milloti*, n. sp. (foss.), SAUVAGE, Bull. Soc. Yonne, xlv, p. 37, Upper Lias, Yonne, France.

*Dapedius milloti*, n. sp. (foss.), *id. t. c.* p. 36, Upper Lias, Yonne, France.

*Pholidophorus germanicus*, Quenst. (foss.), recorded from the Upper Lias of Whitby, by A. S. WOODWARD, Geol. Mag. (3) viii, p. 545.

*Belonostomus comptoni*, Ag. (foss.), described and figured by A. S. WOODWARD, P. Z. S. 1890, p. 629, pls. liv & lv, figs. 1-10. *B. ornatus*, n. sp., FELIX, Palæontogr. xxxvii, p. 192, pl. xxviii, figs. 14-18, & pl. xxx, fig. 8. *B. (?) indicus*, n. sp., LYDEKKER, Rec. Geol. Surv. Ind. xxiii, p. 23, Lameta Beds, Dongargaon, India.

*Menaspis armata*, Ewald (foss.): on its structure and systematic position; JAEKEL, SB. nat. Fr. 1891, p. 115.

*Colobodus*, Ag.: notes on these teeth, which are possibly referable to *Lepidotus*; MONTAGU BROWNE, Geol. Mag. (3) viii, p. 501.

*Gonatodus parvidens*, Traq. (foss.), figured by A. S. WOODWARD, Cat. ii, pl. xvi, fig. 7.

*Amblypterus traquairi*, n. sp. (foss.), A. S. WOODWARD, *t. c.* p. 439, pl. xv, fig. 2, Lower Permian, Rhenish Prussia. *A. bibractensis*, p. 7, pl. ii,

fig. 3, & pl. iii, fig. 6, and *levyi*, p. 30, pl. iii, fig. 3, n. spp. (foss.), SAUVAGE, Poiss. foss. Bass. houill. et perm. Autun et Epinac, Permian of Autun.

↓ *Ædua*, n. g., allied to *Amblypterus*, for *Æ. gaudryi*, n. sp. (foss.), *id. t. c.* p. 16, pl. ii, fig. 1, pl. iii, fig. 1, & pl. v, figs. 2-4, Permian of Igornay, France.

↓ *Archeoniscus*, n. g., intermediate between *Amblypterus* and *Palæoniscus*, for *A. rochei*, n. sp. (foss.), *id. t. c.* p. 19, pl. i, figs. 1 & 2, Permian of Igornay, France.

*Palæoniscus landrioti*, n. sp. (foss.), *id. t. c.* p. 21, pl. iii, fig. 3, & pl. v, fig. 9, Permian of Muse, France.

*Rhadinichthys? lallyi*, n. sp. (foss.), *id. t. c.* p. 23, pl. ii, fig. 2, & pl. iii, fig. 4, Permian of Lally, France.

*Acrolepis tasmanicus*, n. sp. (foss.), JOHNSTON & MORTON, P. R. Soc. Tasm. f. 1890, p. 152, Lower Mesozoic Sandstones, near Tinder-box Bay, Tasmania. *A. ? hamiltoni*, n. sp. (foss.), *id. t. c.* p. 102, pl. (1890), Knocklofty Sandstones, Hobart. *A. (?) digitata*, n. sp. (foss.), A. S. WOODWARD, Cat. ii, p. 508, pl. xv, fig. 4, Karoo formation, S. Africa.

*Coccolepis andrewsi*, n. sp. (foss.), *id. t. c.* p. 524, Lower Purbeck Beds, near Salisbury.

*Platysomus gibbosus*, Blainv. (foss.), figured by A. S. WOODWARD, *t. c.* pl. xv, fig. 5. *P. palmaris*, p. 460, pl. xxxiii, Permian of S. Indian Territory, and *lacovianus*, p. 462, pl. xxxi, fig. 1, Coal Measures of Mazon Creek, Illinois, n. spp. (foss.), COPE, P. U. S. Nat. Mus. xiv.

*Ptycholepis barrati*, Sauv. (foss.), described and figured by SAUVAGE, Bull. Soc. Yonne, xlv, p. 33, pl. i.

## CROSSOPTERYGII.

POLLARD, H. B. On the Anatomy and Phylogenetic Position of *Polypterus* (Preliminary Communication). Anat. Anz. vi, pp. 338-344, figs.

The author concludes that the ancestry of the Urodele Batrachians must be sought among the Crossopterygian forms now represented only by *Polypterus* and *Culamoichthys*; and that the Holocephali are Dipnoan forms which have lost their dermal bones, and retrograded in some respects towards the Selachian type.

*Polypterus büttikoferi*, n. sp., STEINDACHNER, Notes Leyd. Mus. xiii, p. 179, Liberia.

*Cœlacanthus elegans*, Newb., pl. xiv, fig. 2, and *huxleyi*, Traq., pl. xiv, fig. 1, figured by A. S. WOODWARD, Cat. ii (foss.).

*Thursius pholidotus*, Traq. (foss.), figured by A. S. WOODWARD, *t. c.* pl. xiii, figs. 2 & 3.

*Onychodus arcticus*, A. S. Woodw. (foss.), figured by A. S. WOODWARD, Ann. N. H. (6) viii, pl. ii, fig. 12.

*Megalichthys nitidus*, Cope (foss.): on the paired fins; COPE, P. U. S. Nat. Mus. xiv, p. 457, pl. xxxii. *M. hiberni*, Ag. (foss.), figured by A. S. WOODWARD, Cat. ii, pl. xiii, fig. 4. *M. intermedius*, n. sp., *id. t. c.* p. 384, Coal Measures, South Scotland and North Staffordshire.

*Osteolepis macrolepidotus*, Ag. (foss.), figured by A. S. WOODWARD, Cat. ii, pl. xiii, fig. 1.

*Porolepis*, n. g. (allied to *Osteolepis*?), for *Gyropterychius posnaniensis*, Kade (foss.), *id. Ann. N. H.* (6) viii, p. 8, pl. ii, figs. 6-10.

*Sauripterus anglicus*, n. sp. (foss.), *id. Cat. ii*, p. 366, pl. xvi, figs. 4-6, Upper Old Red Sandstone, Shropshire.

*Rhizodopsis robusta*, n. sp. (foss.), *id. t. c.* p. 357, pl. xvi, fig. 3, Coal Measures of Glatz, Silesia.

*Strepsodus brockbanki*, n. sp. (foss.), J. W. DAVIS, Mem. Soc. Manch. (4) iv, p. 427, Upper Coal Measures Limestone of Levenshulme, near Manchester.

J. V. ROHON, Bull. Ac. Pétersb. (2) i, pp. 397-410 (1890), remarks on the vertebral column of *Dendrodus* and *Osteolepis*.

*Holoptychius*, Ag. (foss.): notes on scales; *id. op. cit.* ii, p. 1. *H. varius*, p. 17, pl., figs. 1-5, Upper Devonian, St. Petersburg and Livonia, and *superbus*, p. 18, Upper Devonian, Livonia, n. spp., *id. t. c.* *H. (Glyptolepis) leptopterus*, Ag., figured by A. S. WOODWARD, Cat. ii, pl. xi, fig. 2.

*Otomilla*, n. g., for *O. speciosa*, n. sp. (foss.), FELIX, Palæontogr. xxxvii, p. 189, pl. xxix, fig. 3, & pl. xxx, figs. 3-5, Cretaceous, Puebla, Mexico.

## DIPNOI.

A. S. WOODWARD, Cat. Foss. Fish. ii, p. 234, divides this subclass into two orders: SIRENOIDEI (*Dipteridæ*, *Phaneropleuridæ*, *Ctenodontidæ*, *Lepidosirenidæ*) and ARTHRODIRA (*Coccosteidæ*, *Asterosteidæ*, *Phyllolepidæ*, *Mylostomatidæ*).

## SIRENOIDEI.

VANHÖFFEN, —. Ueber die *Ceratodus*flosse. Verh. Ges. Deutsch. Naturf. 1890, ii, p. 134.

PARKER, W. N. On the Anatomy and Physiology of *Protopterus annectens*. Abstract. P. R. S. xlix, pp. 549-554.

BURCKHARDT, R. Die Zirbel von *Ichthyophis glutinosus* und *Protopterus annectens*. Anat. Anz. vi, pp. 348 & 349.

*Protopterus annectens*, Ow.: notes on the habits in confinement; H. LACHMANN, Zool. Gart. xxxii, p. 129: on a renewed pectoral limb; BOULENGER, P. Z. S. 1891, p. 147; C. HOPLEY, Am. Nat. xxv, p. 487, fig.

F. TELLER, Abh. Geol. Reichsanst. xv, Heft 3, reviews our knowledge of the skull of *Ceratodus* and allied forms.

*Epiceratodus*, n. g., for *Ceratodus forsteri*, Krefft; *id. t. c.* p. 37.

*Ceratodus sturii*, n. sp. (foss.), *id. t. c.* p. 1, pls. i-iv, Upper Trias, Polzberg, Austria.

*Ctenodus cristatus*, Ag., and *murchisoni*, Ward (foss.), figured by A. S. WOODWARD, Cat. ii, pl. iv.

*Megapleuron rochei*, Gaudry (foss.), figured by SAUVAGE, Poiss. foss. Bass. houill. et perm. Autun et Epinae, pl. v, fig. 1.

## ARTHRODIRA.

COPE, E. D. On the Cranial Structure of *Macropetalichthys*. P. U. S. Nat. Mus. xiv, pp. 449-456, pls. xxix & xxx.

*Macropetalichthys*, Ow. : COPE, *t. c.* pp. 449 & 457, discusses the cranial structure of *M. raphielolabis*, Ow., and *sullivantii*, Newb., and describes the paired fins of *M. nitidus*, Cope.

*Coccosteus decipiens*, Ag. : notes on its structure ; TRAQUAIR, P. Phys. Soc. Edinb. 1889-90, p. 211, pl. xi : figured by A. S. WOODWARD, Cat. ii, pl. vii. *C. disjunctus*, n. sp., *id. t. c.* p. 292, pl. viii, figs. 1-4, Upper Old Red Sandstone, Ireland.

*Phlyctænius anglicus*, Traq., redescribed by TRAQUAIR, *t. c.* p. 227, pl. xii.

*Holonema*, Newberry : on the pectoral limb ; COPE, P. U. S. Nat. Mus. xiv, p. 456, pl. xxx, fig. 7 : on the dermal plates ; H. S. WILLIAMS, P. Am. Ass. xxxix, p. 337.

*Homosteus milleri*, Traq. : notes on some dermal plates by A. S. WOODWARD, P. Z. S. 1891, p. 198, figs.

↓ *Asteroplax*, n. g., referred to the *Arthrodira*, but of uncertain family-affinities. *A. scabra*, n. sp., A. S. WOODWARD, Ann. N. H. (6) viii, p. 11, pl. iii, Devonian of Spitzbergen.

## OSTRACODERMI.

This subclass is divided into two orders by A. S. WOODWARD, Cat. foss. Fish. ii, p. 159 :—*Heterostraci* (*Pteraspidae*) and *Osteostraci* (*Cephalaspidae*, *Tremataspidae*, *Asterolepidae*, and *Ceraspidae*).

## HETEROSTRACI.

*Cyathaspis macculoughii*, n. sp., A. S. WOODWARD, Cat. ii, p. 172, pl. ix, fig. 4, Lower Old Red Sandstone, Herefordshire.

*Pteraspis nathorsti*, Lank. : note by A. S. WOODWARD, Ann. N. H. (6) viii, p. 2, pl. ii, fig. 1.

## OSTEOSTRACI.

*Cephalaspis murchisoni*, Egert., figured by A. S. WOODWARD, Cat. ii, pl. x, figs. 1-4.

*Pterichthys milleri*, Ag., pl. v, figs. 2-7, *testudinarius*, Ag., pl. v, fig. 8, & pl. vi, fig. 1, *productus*, Ag., pl. v, fig. 9, & pl. vi, fig. 2, and *oblongus*, Ag., pl. v, fig. 10, & pl. vi, figs. 3 & 4, figured ; *id. ibid.*

## INCERTÆ SEDIS (ICHTHYODORULITES).

*Acanthaspis decipiens*, p. 4, pl. i, and *minor*, p. 6, pl. ii, figs. 2-5, n. spp., A. S. WOODWARD, Ann. N. H. (6) viii, Devonian of Spitzbergen.

*Psammosteus arenatus*, Ag.: note by A. S. WOODWARD, t. c. p. 10, pl. ii, fig. 11.

*Ctenacanthus amblyxiphias*, n. sp., COPE, P. U. S. Nat. Mus. xiv, p. 449, pl. xxviii, fig. 3, Permian of Texas.

## HOLOCEPHALI.

G. B. HOWES, P. Z. S. 1890, p. 687, remarks on the pectoral fin-skeleton of the Liassic *Squaloraja polyspondila*, which he regards as indubitably a Chimæroid, in accordance with A. S. WOODWARD, Cat. foss. Fish. ii, p. 40.

*Myriacanthus paradoxus*, Ag., pl. ii, figs. 1-3, and *granulatus*, Ag. (foss.), pl. ii, fig. 4, & pl. iii, figs. 3 & 4, figured by A. S. WOODWARD, t. c.

✓ *Palæmylus*, n. g., for the following fossil species:—*Rhynchodus crassus*, Newb., *R. frangens*, Newb., and *R. greenei*, Newb.; *id.* t. c. p. 39.

*Chimæra pliocenica*, n. sp. (foss.), *id.* Cat. foss. Rept. ii, p. 91, pl. i, fig. 15, Pliocene of Tuscany.

An egg-capsule of *Callorhynchus*? figured by ALCOCK, Ann. N. H. (6) viii, p. 22.

✓ *Vaillantoonia virei*, n. g. & sp., for the impression of a fossil egg-case of a Chimæroid; S. MEUNIER, C.R. cxii, p. 1154.

## ELASMOBRANCHII.

### ACANTHODII.

REIS, O. Zur Kenntniss des Skelets der Acanthodinen. Geogr. JB. iii, pp. 1-43, figs. (1890).

*Acanthodes nitidus*, n. sp., A. S. WOODWARD, Cat. foss. Fish. ii, p. 9, Calciferous Sandstones, Dumfriesshire. *A. mitchelli*, Egert., figured; *id.* t. c. pl. i, fig. 7.

*Ischnacanthus gracilis*, Egert., figured; *id.* t. c. pl. i, fig. 8.

*Diplacanthus longispinis*, Egert., figured; *id.* t. c. pl. iii, fig. 1.

### SELACHII.

REX, H. Beiträge zur Morphologie der Hirnvenen der Elasmobranchier. Morph. JB. xvii, pp. 417-466, pls. xxv-xxvii.

GEGENBAUER, C. Ueber Cöcalanhänge am Mitteldarm der Selachier. Op. cit. xviii, pp. 180-184, fig.

- DOHRN, A. Studien zur Urgeschichte des Wirbelthierkörpers. 16. Ueber die erste Anlage und Entwicklung der Augenmuskelnerven bei Selachiern und das Einwandern von Medullarzellen in die motorischen Nerven. MT. z. Stat. Neap. x, pp. 1-40, pls. i-v.
- KILLIAN, —. Zur Metamerie des Selachierkopfes. Verh. Anat. Ges. 1891, pp. 85-107, figs.
- FRORIEP, —. Zur Entwicklungsgeschichte der Kopfnerven. T. c. pp. 55-65, figs.
- I. Ueber die Entwicklung des Trochlearis bei *Torpedo*.  
 II. Ueber die Kiemenspaltenorgane der Selachierembryonen.
- VALENTI, G. Contribution à l'histogénèse de la cellule nerveuse et de la névrologie du cerveau de certains poissons chondrostéiques. Arch. Ital. Biol. xvi, pp. 247-252.
- \*MEHRDORF, C. Beiträge zur Kenntniss des anatomischen Baues und der Entwicklungsgeschichte der embryonalen Anhangsgebilde bei den lebendig gebärenden Haifischen. Rostock: 1890, 8vo, 51 pp.
- RÜCKERT, J. Zur Befruchtung des Selachiereies. Anat. Anz. vi, pp. 308-322. Also Verh. Anat. Ges. 1891, pp. 253 & 254.

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- PARKER, T. J. Notes on the Foetal Membranes of *Mustelus antarcticus*. Tr. N. Z. Inst. xxii, pp. 331-333, pl. xix (1890).
- F. HILGENDORF, SB. nat. Fr. 1891, describes some pathological modifications in the dentition of a *Galeus*.
- Corax lindstromi*, n. sp. (foss.), J. W. DAVIS, Tr. R. Dubl. Soc. (2) iv, p. 412, pl. xlii, figs. 3-11, Cretaceous of Scandinavia.
- Lamna cornubica*, Gm.: note on a Tasmanian specimen; R. M. JOHNSTON, P. R. Soc. Tasm. f. 1887, p. 46 (1888).
- Scapanorhynchus tenuis*, p. 385, pl. xxxviii, figs. 10-13, *latus*, p. 386, figs. 14-17, and *gracilis*, p. 386, figs. 18-20, n. spp. (foss.), J. W. DAVIS, t. c., Cretaceous formations of Scandinavia.
- Odontaspis fuxensis* and *kopingensis*, n. spp. (foss.), *id. t. c.* p. 390, pl. xxxviii, figs. 26-28, Cretaceous of Scandinavia. *O. houzeaui*, n. sp. (foss.), A. S. WOODWARD, Geol. Mag. (3) viii, p. 111, pl. iii, figs. 7 & 8, Danian of Cipley, Belgium.
- Oxyrhina lundgreni*, p. 393, pl. xxxix, figs. 8-13, and *conica*, p. 397, pl. xl, figs. 8-10, n. spp. (foss.), J. W. DAVIS, Tr. R. Dubl. Soc. (2) iv, Cretaceous of Scandinavia.
- Otodus limhamnensis*, n. sp. (foss.), *id. t. c.* p. 405, pl. xli, fig. 12, Cretaceous of Sweden.
- Selache maxima*, L.: on its occurrence in New Zealand; CHEESEMAN, Tr. N. Z. Inst. xxiii, p. 126.
- Eulamia (Platyodon) platyrhynchus*, n. sp., GILBERT, P. U. S. Nat. Mus. xiv, p. 543, Gulf of California.

*Scyllium acanthonotum*, De Fil., is the young of *S. catulus*, Cuv.; BELLOTTI, Atti Soc. Ital. xxxiii, p. 110. *S. hispidum*, n. sp., ALCOCK, Ann. N. H. (6) viii, p. 21, Andaman Sea, 188–220 faths. *S. planum*, n. sp. (foss.), for teeth from the Chalk formation of the I. of Seeland, Denmark, J. W. DAVIS, Tr. R. Dubl. Soc. (2) iv, p. 383, pl. xxxviii, fig. 9.

*Catulus xaniurus*, p. 540, *cephalus*, p. 541, and *brunneus*, p. 542, n. spp., GILBERT, P. U. S. Nat. Mus. xiv, Gulf of California.

*Euprotomicrus hyalinus*, n. sp., R. S. EIGENMANN, P. Cal. Ac. Sci. (2) iii, p. 35, Pacific Ocean, between Honolulu and San Francisco.

*Hybodus regularis*, n. sp. (foss.), COPE, P. U. S. Nat. Mus. xiv, p. 448, pl. xxviii, fig. 2, Trias (?), Texas.

✓ *Stypobasis knightiana*, n. g. & sp. (foss.), for a tooth, the crown of which resembles *Oxyrhina* and the root *Dendrodus*. *Id. t. c.* p. 447, pl. xxviii, fig. 1, Permian of Nebraska.

## TECTOSPONDYLI.

HOWES, G. B. Observations on the Pectoral Fin-Skeleton of the Living Batoid Fishes, and of the Extinct Genus *Squaloraja*, with especial reference to the Affinities of the same. P. Z. S. 1890, pp. 675–688, figs.

- I. The Pectoral Fin-Skeleton of the Trygonoid *Pteroplatea hirundo*.
- II. The Pectoral Fin-Skeleton of *Pteroplatea*, compared with that of the *Raiidae* and of the *Selachioidei*.
- III. The Pectoral Fin-Skeleton of *Trygon*, *Urolophus*, and *Myliobatis*, compared with that of *Raia* and *Pteroplatea*.
- IV. The Pectoral Fin-Skeleton of *Miliobatis* and of the *Torpedinidae*.
- V. The Pectoral Fin-Skeleton of the *Rhinobatidae*.

HOWES, G. B. On the Visceral Anatomy of the Australian Torpedo (*Hyppos subnigrum*), with especial reference to the Suspension of the Vertebrate Alimentary Canal. P. Z. S. 1890, pp. 669–675, pl. lvii.

COGGI, A. Les vésicules de Savi et les organes de la ligne latérale chez les torpilles. Arch. Ital. Biol. xvi, pp. 216–224, pl.

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PLATT, JULIA B. A Contribution to the Morphology of the Vertebrate Head, based on a Study of *Acanthias vulgaris*. J. Morph. v, pp. 79–106, pls. iv–vi.

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*Pristis*, Lath.: the fossil species monographed by G. VIGLIAROLO, Atti Acc. Nap. (2) iv, App. No. 3, 28 pp., 1 pl. *P. lyceensis*, n. sp. (foss.), *id. t. c.* p. 17, pl., figs. 1–6, Miocene of Lecce Italy.

*Squalus infernus*, Blainv., = *Spinax niger*, Sagre ; E. MOREAU, Bull. Soc. Zool. xvi, p. 47.

*Læmargus borealis*, Scor. : notes by DAWSON, Can. Rec. iv, p. 304, pl. iv.

*Raia fyllæ*, Ltk. : note by LÜTKEN, Vid. Medd. 1891, p. 32. *R. trachura*, n. sp., GILBERT, P. U. S. Nat. Mus. xiv, p. 539, Gulf of California, 822 faths.

*Rhinoptera steindachneri*, n. sp., EVERMANN & JENKINS, t. c. p. 130, pl. i, fig. 1, W. Coast of Mexico.

*Torpedo sinus-persici*, Kæmpf., figured by SAUVAGE, Hist. Madag. xvi, pl. i.

## ICHTHYOTOMI.

A. FRITSCH, Zool. Anz. xiv, pp. 21 & 22, sums up the results of his investigation of the *Xenacanthidæ*.

## CYCLOSTOMATA.

BEHREND, —. Untersuchungen über die Hornzähne von *Myxine glutinosa*. Zool. Anz. xiv, pp. 83-87.

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2. Zur Kenntniss des centralen Nervensystems von *Amphioxus lanceolatus* ; pp. 29-46, pls. xi-xiv.



- RETZIUS, G. Das hintere Ende des Rückenmarks und sein Verhalten zur Chorda dorsalis bei *Amphioxus lanceolatus*. Biol. Fören. iv, pp. 10-15, figs.
- LWOFF, B. Ueber Bau und Entwicklung der Chorda von *Amphioxus*. MT. z. Stat. Neap. ix, pp. 483-502, pl. xvi.
- WILLEY, A. W. The Later Larval Development of *Amphioxus*. Q. J. Micr. Sci. xxxii, pp. 183-234, pls. xiii-xv.



# TUNICATA.

BY

PROFESSOR W. A. HERDMAN, D.Sc., F.R.S.

## LIST OF PUBLICATIONS.

1. GIARD, A. Sur le bourgeonnement des larves d'*Astellium spongiforme*, Gd., et sur la Pœcilogonie chez les Ascidies Composées. C.R. cxii, pp. 301-304, Feb. 2, 1891.
2. GARSTANG, W. On some Ascidians from the Isle of Wight : a Study in variation and nomenclature. J. Mar. Biol. Ass. (n.s) ii, No. 2, pp. 119-140, pls. vi & vii.
3. —. Report on the *Tunicata* of Plymouth. Part I. *Clavelinidæ*, *Perophoridæ*, *Diazonidæ*. T. c. No. 1, pp. 47-67, pl. ii.
4. —. Note on a New and Primitive Type of Compound Ascidian. Ann. N. H. (6) viii, pp. 265-268, and Zool. Anz. 14 Jhg., No. 378, pp. 422-424.
5. HARTMANN, R. Ueber den Chorda-ähnlichen Strang im Schwanz der larven von *Ascidia patellæformis*. SB. nat. Fr. 1891, No. 1, pp. 4-7.
6. HERDMAN, W. A. Biological Results of the Cruise of the s.y. "Argo" round the West Coast of Ireland in August, 1890. Tr. Biol. Soc. Liverp. v, pp. 181-212, pls. viii-x.
7. —. The Classification of the *Tunicata* in relation to Evolution. Nature xlv, No. 1128, pp. 130-133.
8. —. A Revised Classification of the *Tunicata*, with definitions of the orders, suborders, families, subfamilies, and genera, and analytical keys to the species. Linn. Soc. Journ. Zool. xxiii, pp. 558-652.
9. —. Note on *Diazona* and *Syntethys*. Ann. N. H. Aug., 1891, pp. 165-169.
10. KOROTNEFF, A. DE. La *Dolchinia mirabilis* (Nouveau Tuniciér). MT. z. Stat. Neap. x, Ht. 2, pp. 187-205, pls. xii & xiii.

11. KOWALEVSKY, A. Sur la métamorphose des larves des Ascidies et la formation du Manteau (in Russian). Rev. Sci. Nat. St. Petersburg. 1 ann., No. 9, pp. 378-390. *Résumé*, p. 429.
12. LEE, A. B. On a little-known Sense-organ in *Salpa*. Q. J. Micr. Sci. xxxii, pp. 89-97, pl. x.
13. MATZDORFF, C. Ueber den Generations-wechsel der Salpen (nach O. Seeliger). Naturw. Wochenschr. v, No. 44, p. 438.
14. MINGAZZINI, P. Sulla rigenerazione nei Tunicati. Boll. Soc. Nat. Napoli (1) v, fasc. 1, pp. 76-79.
15. PIZON, A. Sur la blastogénèse chez les larves d'*Astellium spongi-forme*. CR. cxii, pp. 166-168, Jan. 19, 1891.
16. —. Observations sur le bourgeonnement de quelques Ascidies Composées. T. c. pp. 399-402, and Rev. Sci. xlvii, No. 9, p. 281.
17. —. Sur la blastogénèse chez les Botryllidés. Bull. Soc. Philom. iii, No. 2, pp. 62-65.
18. —. Sur la formation des colonies chez les Botryllidés. T. c. pp. 73-76.
19. —. Sur le développement du ganglion et du pavillon vibratile chez les Botrylles et les Botrylloides. T. c. No. 3, pp. 98-102.
20. SALENSKY, W. Beiträge zur Embryonal-entwicklung der Pyrosomen. Zool. Jahrb. (Abth. f. Anat.), v, Ht. 1, pp. 1-98, 8 pls.
21. SWAINSON, G. New form of Appendicularian "Haus." Brit. Ass. Rep. 1891, pp. 701 & 702.

## ANATOMY.

GARSTANG (2, 3, 4) has some interesting observations on the structure of the branchial sac, &c., in various *Clavelinidæ*, *Diazona*, *Ascidia mollis*, *A. depressa*, *A. mentula*, and *Archidistoma*. He suggests that the pharyngo-cloacal slit, which has now been shown to exist in various species of Ascidians, may be a special adaptation for the prevention of the over-accumulation of fæces in the cloacas of large Ascidians, where the stream of water through small stigmata would be insufficient for ejection. He also discusses the variations and their nomenclature in *Ascidia mentula* and some other forms.

HERDMAN (6) records some variations and abnormalities found in specimens of *Ascididiella aspersa* from the West Coast of Ireland.

SWAINSON (21) describes a new form of Appendicularian "Haus," somewhat like a bishop's mitre. He thinks it serves as a nidamental sac for the ova.

HERDMAN (9) considers, from a comparison of the structure of the branchial sac, &c., of specimens from Naples, from Plymouth, and from the Hebrides, that *Syntethys hebridicus*, Forbes and Goodsir, is the same species as *Diazona violacea*, Savigny.

LEE (12) describes fully a sense-organ in *Salpa*, mentioned in 1876 by USSOW. There are in *S. mucronata* (aggregated form) two organs, one on each side, near the anterior end. Each consists of a tuft of sense-cells on the end of a nerve, and surrounded by a calyx of supporting cells. He considers that the organ is a hydrometric apparatus, which may have been once a taste bulb.

KOROTNEFF (10) describes the minute structure of *Dolchinia mirabilis*, a new member of the *Cyclomyaria*, allied to *Doliolum* and to *Anchinia*. It is a colony formed of a gelatinous tube, bearing the ascidiozooids, which, however, are very slightly attached and readily become free. The ascidiozooids are arranged symmetrically, the youngest being close to the sides of a longitudinal median superior groove, and the oldest furthest from that groove. The inferior side of the colony is free from zooids. Migrating buds may be found in any part between the ascidiozooids. The shape of the ascidiozooids and their general structure is like that of *Doliolum*; and as the muscular system is well developed, movements are definite. The sexual ascidiozooids are hermaphrodite. The blastozooid form which must produce the primary buds, is not yet known. The buds take up a secondary position on the gelatinous tube, which appears to correspond to the large tail-like process of the nurse-form of *Doliolum*.

MINGAZZINI (14) gives the results of some experiments on the regeneration of lost parts made at Naples on *Ciona intestinalis*.

## EMBRYOLOGY.

SALENSKY (20) has now published the third section of his important memoir on the embryonic development of *Pyrosoma*, dealing with the formation of the tetrazooid embryo and the development of the first ascidiozooids. One interesting point he shows is, that in the embryo the stigmata at first are at right angles to the endostyle, but become in the adult parallel to the endostyle and to the longitudinal axis of the body, the body changing its long axis and the endostyle moving to a new position at right angles to its embryonic condition, while the mouth forms in the middle of the surface previously occupied by the endostyle; so that what seemed ventral (endostylar) in embryo becomes anterior (oral) in adult. Therefore the longitudinal slits of the adult are really when first formed in embryo primary stigmata at right angles to endostyle. Of epiblastic origin are: the test (in part), the nervous system, and the peribranchial cavities. From the mesoblast arise: the heart and pericardium, the elæoblast and other problematical organs, the muscles, and the stolonial mesoblast. The development of the enteric cavity in the Cyathozooid and in the Ascidiozooids is described. Salensky considers that the mono-ovular condition of *Salpa* and *Pyrosoma* is derived from a poly-ovular state, as in ordinary Ascidians, and that the kalymmocytes or migrating follicle cells are homologous with test cells and are really abortive ova. Salensky would derive *Pyrosoma* from the *Synascidia*, and

*Salpa* from *Pyrosoma*. He would trace the metagenesis of *Salpa* and *Pyrosoma* to precocious budding of the larval Synascidian.

HARTMANN (5) describes the structure of the tailed larva of *Ascidia patellæformis*, in which he says there may be two eye-spots, as well as the otolith.

There are a number of short papers by PIZON (15-19) and by GIARD (1) on budding and embryonic blastogenesis, and the formation of the colony in Compound Ascidians. Giard points out, in answer to Pizon's criticisms, that the development of eggs, embryos, and larvæ varies considerably under different conditions in Synascidians, and also in some other animals. For these phenomena he proposes the term "pœcilogony."

KOROTNEFF (10) describes the development of the buds in his new genus *Dolchinia*.

## GEOGRAPHICAL DISTRIBUTION.

GARSTANG (3) has commenced a record of the *Tunicata* found in the neighbourhood of Plymouth, and also records a few species from the Isle of Wight.

HERDMAN (6) records some *Tunicata* from the West Coast of Ireland, including two new species—*Molgula holtiana*, from Killybegs, and *Polycarpa argoensis*, from Killary Lough.

KOROTNEFF (10) describes a new form, *Dolchinia mirabilis*, from the Mediterranean.

For a record of the geographical distribution of the known species of *Tunicata*, see HERDMAN (8).

## SYSTEMATIC.

HERDMAN (8) gives a revised classification of the *Tunicata*, with definitions of the groups down to genera, and analytical keys to the species in each genus. The chief divisions are the same as in the Challenger Report, but some changes and additions have been made in the subdivisions. An indication of the geographical distribution of each species is given, and imperfectly characterized species of doubtful position are put in separate lists under the genera. There are about 104 genera and about 830 species. Several new generic groups are instituted, and some new species briefly defined.

GARSTANG (3) separates the genus *Perophora* and its allies from the *Clavelinidæ*, and puts them in a distinct family, the *Perophoridæ*.

## ASCIDIACEA.

### MOLGULIDÆ.

*Molgula holtiana*, n. sp., HERDMAN (6), p. 206.

## CYNTHIIDÆ.

- Rhabdocynthia*, n. g., HERDMAN, (8) p. 575.  
*Rhabdocynthia mollis*, n. sp., *id. ibid.*  
*Rhabdocynthia tenuis*, n. sp., *id. ibid.*  
*Rhabdocynthia subfusca*, n. sp., *id. ibid.*  
*Cynthia galbana*, n. sp., *id. t. c. p. 577.*  
*Forbesella*, n. g., *id. t. c. p. 578.*  
*Styela racemosa*, n. sp., *id. t. c. p. 580.*  
*Styela scortea*, n. sp., *id. t. c. p. 581.*  
*Polycarpa simplex*, n. sp., *id. t. c. p. 583.*  
*Polycarpa ascidioides*, n. sp., *id. t. c. p. 584.*  
*Polycarpa haddonii*, n. sp., *id. t. c. p. 585.*  
*Polycarpa elongata*, n. sp., *id. ibid.*  
*Polycarpa torresiana*, n. sp., *id. ibid.*  
*Polycarpa ænea*, n. sp., *id. ibid.*  
*Polycarpa fulva*, n. sp., *id. ibid.*  
*Polycarpa fastigata*, n. sp., *id. ibid.*  
*Polycarpa argoensis*, n. sp., *id. (6), p. 207.*

## CLAVELINIDÆ.

- Stereoclavella australis*, n. sp., HERDMAN, (8) p. 604.  
*Pycnoclavella*, n. g., GARSTANG, (3) p. 53.  
*Pycnoclavella aurilucens*, n. sp., *id. ibid.*

## ASCIDIIDÆ.

- Ascidia roulei*, n. sp., GARSTANG, (2) p. 130.  
*Ascidia herdmanni*, n. sp., *id. ibid.*

## ASCIDIÆ COMPOSITÆ.

## BOTRYLLIDÆ.

- Sarcobotrylloides purpureum*, n. sp., HERDMAN, (8) p. 609.  
*Sarcobotrylloides pannosum*, n. sp., *id. ibid.*  
*Sarcobotrylloides anceps*, n. sp., *id. ibid.*  
*Sarcobotrylloides jacksonianum*, n. sp., *id. ibid.*

## DISTOMIDÆ.

- Colella plicata*, n. sp., HERDMAN, (8) p. 611.  
*Colella tenuicaulis*, n. sp., *id. ibid.*  
*Colella claviformis*, n. sp., *id. ibid.*  
*Archidistoma*, n. g., GARSTANG, (4) p. 266.  
*Archidistoma aggregatum*, n. sp., *id. t. c. p. 267.*

## POLYCLINIDÆ.

*Psammaplidium incrustans*, n. sp., HERDMAN, (8) p. 620.

*Psammaplidium pedunculatum*, n. sp., *id. ibid.*

*Psammaplidium fragile*, n. sp., *id. ibid.*

*Psammaplidium solidum*, n. sp., *id. ibid.*

*Psammaplidium lobatum*, n. sp., *id. ibid.*

## POLYSTYELIDÆ.

*Chorizocormus sydneyensis*, n. sp., HERDMAN, (8) p. 636.

*Chorizocormus leucophæus*, n. sp., *id. ibid.*

*Chorizocormus subfuscus*, n. sp., *id. ibid.*

*Goodsiria lapidosa*, n. sp., *id. t. c.* p. 637.

## THALIACEA.

## CYCLOMYARIA.

*Dolchinia*, n. g., KOROTNEFF, (10) p. 189.

*Dolchinia mirabilis*, n. sp., *id. ibid.*



# MOLLUSCA.

BY

B. B. WOODWARD, F.G.S., F.R.M.S., &c.

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## II.—ANATOMY, PHYSIOLOGY, &amp;c.

## 1. GENERAL.

Anatomy of *Chaunoteuthis mollis*, n. g. & sp.; APPELLÖF (6).—Anatomy of *Todarodes sagitatus*; POSSELT (355).—Anatomy of *Chtenopteryx fimbriata*, *Veranya sicula*, and *Calliteuthis alessandrini*; APPELLÖF (5).—Anatomy and histology of *Cymbuliopsis calceola*, which has points in common with *Cymbulia* and with *Gleba*; PECK (317).—The comparative anatomy of the *Gastropoda* (*Cochlides* and *Ichnopodes*) in connection with their classification, reviewed by VON JHERING (200).—LANG (228) discusses the asymmetry of *Gastropoda*, which he considers has been brought about primarily by the development of a high turritiform shell.—Anatomy of the slugs of Portugal and the Azores; SIMROTH (397).—Anatomy of 5 species of *Testacella*, and 2 of *Daudebardia*; PLATE (353).—Anatomy of *Parmella etheridgei*, Brazier; HEDLEY (174).—Anatomy of *Arion hortensis*; RUTHERFORD (373).—Anatomy of 3 new species of *Vaginula*, with figs.; SIMROTH (399).—Anatomy of 3 species of *Atopos*, n. g.; SIMROTH (400).—Anatomy (with figs.) of *Bulimus dufresni*, Leach; *B. tasmanicus*, Pfr.; *Anoglypta launcestonensis*, Reeve; *Rhytida lampra*, Pfr.; *Helicarion verreauxi*, Pfr.; *Cystopelta petterdi*, Tate; HEDLEY (171).—Anatomy of *Cryptazeca monodonta*, with figs.; FOLIN (125).—Anatomy of species of *Planorbis* in Wurttemberg; BUCHNER (50).—Anatomy and development of *Corambe testudinaria*; FISCHER, H. (113, 114).—Anatomical notes on the *Aplysiidæ*; MAZZARELLI (272).—Anatomy and dentition of *Stomatella*; PILSBRY (331).—Anatomy of 9 species of *Neomeniidæ*; PRUVOT (357).—Anatomy of *Dondersia banyulensis* and *D. flavens*; PRUVOT (356).—Anatomy (with figs.) of representative *Pelecypoda*, and their comparative anatomy, with a view to their classification; PELSENEER (318).—Anatomy and circulation in representative *Pelecypoda*; MÉNÉGAUX (279).—Anatomy of *Entovalva mirabilis* (parasitic in the alimentary canal of *Synapta*); VOELTZKOW (448).

## 2. SHELL AND INTEGUMENT.

Molluscan shell and periostracum; QUILTER (358).—Position of the last septum in the shells of *Nautili* and *Ammonites*; scars of shell muscles; BUCKMAN (52).—Young shell of *Baculites compressus*, Say, has spiral of 2 to  $2\frac{1}{2}$  turns; BROWN (48).—Shells of *Lituitidæ*; REMELÉ (362).—Structure of the complete shell of *Ascoceras* described and figured; LINDSTRÖM (232): abstr., with figs., FOORD, (126) Supp. pp. 384–391.—The hypothesis of Simroth and of von Jhering, that the depression of the spire in spirally wound *Gastropods* may, if carried on, result in the formation of a false umbilicus and a sinistrosity of the shell unaccompanied by any corresponding change in the organisation of the animal, receives proof in the conformation of the operculum: *Lanistes*, the *Lima-*

*cinidæ*, and the larvæ of *Cymbuliidæ* are thus ultra-dextral; PELSENEER (321) [*cf.* LANG (228)].—Growth of the shell in *Helix aspersa*; VILLEPOIX (445).

Banding of *Helix nemoralis* and *H. hortensis*; HORSLEY (192).—Colour and banding in land and freshwater shells; WILLIAMS (470), WEBB (457).—Sculpture of American *Limnæas*; STEARNS (421).

The shell of *Parmophorus* covers the whole of the body, and not the anterior portion only, as figured by Pelseeneer; BOUTAN (36).—Structure of the integument of Chitons; BLUMRICH (25).—Accessory plates and their use in classification; DUBOIS (102).—Accessory plate to *Corbula henckelinsi*; VINCENT (446).

Structure of the shelly tube of *Gastrochæna*; SLUITER (403).

Much thickened variety of *Bulinus bivaricosus*; ETHERIDGE (108).

Deformities in shells [amongst which is included *Vermetus*!]; MARTIN (259).—Some common deformities of the shell of *Clausilia rugosa*; COCKERELL (61).

Epipodium of *Mollusca*; PELSENEER (319).

Chromatophores of *Cephalopoda* are pigmented elastic spheres whose movements of expansion are determined by the contraction of radial muscles; PHISALIX (328).—The radial fibres are not muscles but connective tissue; BLANCHARD (20).—The chromatophores of *Cephalopoda* *Octopoda* have an ectodermic and their accessory parts a mesodermic origin; JOUBIN (205).

Autonomy and reproduction of the dorsal appendages (*Phoenicurus*) of *Tethys leporina*; PARONA (314).

### 3. MUSCULAR SYSTEM.

Nothing.

### 4. DIGESTIVE SYSTEM.

Mandibles of fossil Nautiloids; FOORD (126).—Radulæ of *Mollusca*; THIELE continues TROSCHER'S monograph, completing the *Rhipidoglossa* and beginning the *Docoglossa*; (441).—The liver of *Testacella* exhibits every form of passage between tessellated and cylindrical epithelium; CHATIN (59).—The liver of *Nudibranchiata* is homologous with that of the *Pelecypoda*, and is in great part formed by the left hepatic lobe of the embryo; FISCHER, H. (115).

### 5. CIRCULATORY SYSTEM.

Nuclear division in the amœboid cells of *Cephalopoda* takes place by fragmentation; CATTANEO (57).—Relationship of the circulatory apparatus to the nervous system in *Gastropoda*; BOUVIER (38).—A heart is present in *Dentalium*, and was figured by Lacaze-Duthiers, who overlooked it. It is rudimentary, and consists of nothing more than a sac-



cular invagination into the lumen of the pericardium of part of the dorsal pericardial wall ; PLATE (354).—The heart of *Arca*, which is single, described ; FRANÇOIS (134).—Circulatory system in *Pelecypoda* is fully discussed by MÉNÉGAUX (279), who also treats of its rôle in connection with turgescence.—Turgescence in *Pelecypoda* is effected by the blood alone. In those having a well-developed foot there is a bojano-pedal opening, furnished with a sphincter ; MÉNÉGAUX (280).—Bulbus arteriosus and valves of the aorta of *Pelecypoda* ; GROBBEN (162).—Histology of the blood of *Pelecypoda* ; GRIESBACH (161).

## 6. RESPIRATORY SYSTEM.

CONTEJEAN (73, 74) can only find flat nucleated cells lining the wall of the pulmonary cavity of the snail.

Respiration in *Ampularia* ; BOUVIER (40)

## 7. EXCRETORY AND SECRETORY SYSTEM.

Urinary apparatus of *Limax*, *Amalia*, and *Arion* ; PLATE, (353) pp. 580–586.—Renal function in *Acephala* (*Pecten* and *Cardium*) ; LETELIER (230).—The gland described by Bohadsch ("glandola opalina" of Vayssière) exists in general in all the *Aplysiidæ*. It is formed of enormously developed glandular cells, derived from the ectoderm ; these cells are of three kinds, and yield as many different secretions. Its morphology and physiology are fully treated ; MAZZARELLI (273).—Byssus of young *Maleagrina* ejected and renewed ; the old shells are not attached ; KENT (214).—Byssus in *Unio* ; STERKI (424).—Perforation of bivalves by *Natica* is apparently effected by means of a boring gland situated on the under side of the extremity of the proboscis ; SCHIEMENZ (385).

## 8. NERVOUS SYSTEM.

Nervous system of *Cypræa* ; BOUVIER (39).—Development of the central nervous system of *Pulmonata* ; SCHMIDT (387).—In *Veranya sicula* there are two commissures between the visceral ganglia ; APPELLÖF (5).—Innervation of epipodial processes of some *Nudibranchiata* : in *Polycera*, *Ancula*, *Tritonia*, and *Dendronotus*, the epipodial nerves arise from pleural ganglia, or from the ventral and posterior parts of cerebro-pleural masses ; while in *Eolis* the chief epipodial nerves are from the pedal ganglia ; HERDMANN & CLUBB (181).

Relationship of the circulatory apparatus to the nervous system in *Gastropoda* ; BOUVIER (38).

## 9. SENSORY ORGANS.

Physiology of the retina of *Cephalopoda* ; RAWITZ (360).—Displacement of pigment in the *Cephalopod* eye under the influence of darkness ;

RAWITZ (359).—Terrestrial *Pulmonates* can distinguish objects at 1 cm. distance; but only distinguish form at 1–2 mm.: Aquatic *Pulmonates* have no distinct vision: *Pulmonate Gastropods* possess dermatoptic perception; WILLEM (468).—Eyes of *Pulmonata Basommatophora* have a preocular lacuna; WILLEM (469).—The size of the eyes in *Pecten opercularis* increases with the diameter of the animal; but their number varies; BRINDLEY (46).—Otocysts of the *Nuculidae* throughout life communicate freely with the exterior; PELSENEER (324).—Organ of smell in *Testacella* and the *Pulmonata* generally; PLATE, (353) chap. xi.

## 10. GENERATIVE ORGANS.

Genitalia of some Trencsen land *Mollusca*; BRANCSIK (42).—Genitalia of *Helix pietruskyana*, Parr.; *H. vicina*, Ross.; *H. rossmüssleri*, Pfr., and var. *budayi*; *H. cingulella*, Zgl.; BRANCSIK (41).—Genitalia of *Hadra gulosa*, Gould; HEDLEY (176).—Genitalia of the *Aplysiæ* of the Gulf of Naples; MAZZARELLI (274).—Genitalia of *Pleurobranchæa*, *Oscanius*, and *Acera*; MAZZARELLI (270).—The *Septibranchiata* and *Eulamellibranchiata Anatinacea* are hermaphrodite, with distinct male and female glands; PELSENEER (323).—Spermatogenesis in *Cymbulia peronii* and *Sepia officinalis*; PICTET (330).—Generative organs of the Irish slugs figured; SCHARFF (380).—Genitalia of some Grecian slugs; SIMROTH (398).—Genitalia of *Zonitidæ* from Borneo; GODWIN-AUSTEN (147).—Genitalia of *Malacolimax melitensis* and of *Agriolimax caruanae*, n. spp.; POLLONERA (478).

## 11. EMBRYOLOGY.

Cleavage of the ovum in *Cephalopoda*, founded on an embryological study of *Loligo pealei*; WATASE (455).—Development of *Clione limacina*; KNIPOWITSCH (218).—Ova of *Helicarion robustus*, Gould; HEDLEY (173).—Notes on the eggs of British non-marine *Mollusca*; GAIN (140A).—Embryology of *Crepidula fornicata* and *Urosalpinx cinerea*; CONKLIN (72).—Development of *Paludina vivipara*; ERLANGER (105).—Development of *Bythinia tentaculata*; ERLANGER (106).—The young *Parmaphorus* shows a trace of torsion and occupies the lower portion of the shell, which at that age is not enlarged; the notch, which is scarcely visible in the anterior margin of the adult shell, is very marked in the young; the mantle only partly covers the shell; BOUTAN (37).—Embryology of *Ostrea glomerata*; KENT (214A).—Development of *Dreissensia polymorpha*; KORSCHULT (225), WELTNER (458).—Glochidia of *Anodon* and *Unio*; LATTE (229).—Embryonal development of *Anodonta piscinalis*; GOETTE (148).—Development of *Entovalva mirabilis*, n. g. & sp., of parasitic *Pelecypod*; VOELTZKOW (448).

## 12. PHYLOGENY AND CLASSIFICATION.

Phylogenetic affinities of *Mollusca* ; THIELE (437).

JHERING (200) has modified his system of classification of the *Mollusca*, which he now summarizes as follows :—

## MOLLUSCA, Cuvier.

## I. Phylum ARTHROMALAKIA, von Jher.

1. Class *Amphineura*, von Jher.
2. Class *Acephala*, Cuvier.
3. Class *Cephalopoda*, Cuvier.
4. Class *Solenconcha*, Lacaze-Duth.
5. Class *Cochlidæ*, von Jher.
  1. Order *Orthonæura*, von Jher.
  2. Order *Chiastoneura*, von Jher.
  3. Order *Heteropoda*, Lamk.

## II. Phylum PLATYMALAKIA, von Jher.

1. Class *Ichnopoda*, von Jher.
  1. Order *Nudibranchia*, Cuvier.
    1. Suborder *Phanerobranchia*, von Jher.
    2. Suborder *Triaula*, von Jher.
  2. Order *Sacoglossa*, von Jher.
  3. Order *Pleurobranchia*, von Jher.
  4. Order *Tectibranchia*, Cuvier.
  5. Order *Branchiopneusta*, von Jher.
  6. Order *Nephropneusta*, von Jher.
2. Class *Pteropoda*, Cuvier.

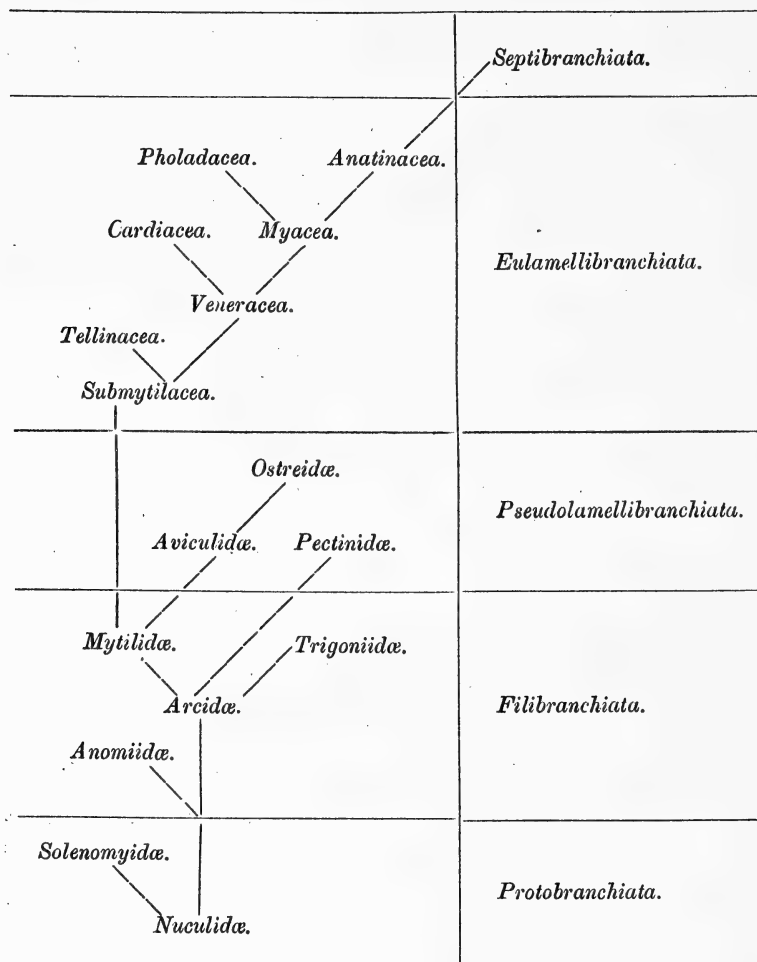
This classification is yet more fully set forth in a phylogenetic tree.

Phylogeny of Jurassic *Belemnites* ; PAVLOW, (316) pp. 272-276.—Phylogenetic relationships of the species of *Polymorphidæ* and of the *Amalteidæ* from the Inferior Oolite ; BUCKMAN (51).—*Ascoceratidæ* and *Litnitidæ* ; LINDSTRÖM (232).—Tentative classification of *Litnitidæ* ; REMELÉ (362).—Proposed classification of slugs ; COCKERELL (62).—Classification of American land snails ; PILSBRY (339).—Phylogeny and classification of the *Nudibranchiata Cladohepatica* ; BERGH (17).—Classification of *Cryptobranchiate Dorididæ* ; BERGH (18).—Phylogenetic relationships of the Tertiary species of *Galeodoliidæ*, *Doliidæ*, *Ficulidæ*, *Naticidæ*, *Scalariidæ*, *Aclidæ*, *Cassididæ*, *Terebridæ*, and *Fusionellidæ*, from Piedmont ; SACCO (376).

Classification of *Pleurotomidæ* ; HOERNES & AUINGER (190).—Classification of *Rhipidoglossa* and *Docoglossa* ; TRYON (442) : of *Helicidæ* ; *id.* (443).

PELSENEER, in 1889, published a preliminary account of his proposed phylogenetic classification of the *Pelecypoda*, taking the gill-structure

and its morphology as his basis (318). In the completed treatise (320) the scheme is given as follows :—



PELSENEER further points out that the nearest allies to the *Lamellibranchiata* in the Molluscan phylum are the *Rhipidoglossa*. Both are derived from forms, related to the dibranchiate *Rhipidoglossa*, that have not undergone torsion: to these hypothetical forms the name *Prorhipidoglossa* is given.

MÉNÉGAUX, working independently of Pelseeneer, came to similar conclusions. His preliminary sketch [*vide* Zool. Rec. 1889, *Moll.* 23 (10)] appeared shortly after Pelseeneer's, and the final work, as a thesis, (279) in 1890. Ménégau's classification differs principally in that he uses the

term "Foliobranches" for the "Protobranchiata," and unites the *Pseudolamellibranchiata* and *Filibranchiata* under his "Filibranches."

The extended text, so far as completed, of NEUMAYR's scheme (296) of classification of the *Pelecypoda* has been published, under the editorship of SUESS [*cf.* Zool. Rec. 1883, pp. 86 & 87].—*Cardium* is polyphyletic and its forms descended from *Megalodon* through *Pachyerisma*; BOEHM (26).

### 13. STRAY NOTES.

Viviparous nature of *Balea*; CRAVEN & SMITH (82).—Phosphorescence in *Mollusca*; HOYLE, "Luminous Animals," Rep. Manch. Micro. Soc. 1890, p. xxxv.—Mechanical origin of structure in *Pelecypods*; JACKSON (196).—Mode of life of *Acme*; GALLENSTEIN (141).—*Leptum squamosum* commensal in the burrows of *Gebia stellata*; NORMAN (305).—Burrowing habits of certain land and freshwater *Molluscs*; COLLINGE (71).—Snails swimming at the surface of the water; LINDEN (231).—Free-swimming Mussel larva [*Dreissensia*]; BLOCHMANN (24).—*Natica perforates* bivalves apparently by means of a special gland; SCHIEMENZ (385).—Thread-spinning *Mollusca*: *Limax*; GIRARD, Helios, 1891, p. 27. —*Murex fortispina* opens the valves of *Arca*, on which it preys, by means of a tooth-like process on the outer lip; FRANÇOIS (134).—Parasitic *Mollusca*; COOKE (75).—*Entovalva mirabilis*, n. g. & sp., parasitic *Pelecypod*, and a parasitic *Gastropod* (undescribed); VOELTZKOW (448).—*Entovalva* and *Robillardia*; FISCHER (112).—*Mollusca* in captivity; GAIN (140A).—Food of some British land *Mollusca*; GAIN (140).—Damage caused by *Limax cinereus*; FRIEDEL (136).—Local variation; WINKLEY, Naut. v, p. 63.—Adventitious protection in freshwater *Mollusca*; FRYER (137).—Means of distribution of *Unionidae* in S.E. United States; SIMPSON (394).—Appearance of *Mollusca* in artificial ponds; the eggs of *Limnæa auricularia* pass unharmed through the digestive system of swans; PASCAL (315).—Discussion of the question; FISCHER (118).—Glacial period and British non-marine *Mollusca*; QUILTER, Conchologist, 1891, p. 18.—Slugs and frost; LOWE (240).—Destruction of slugs and snails by toads and frogs; NOEL (P.), Rev. Sci. Nat. Ouest. 1891, p. 261.—*Psyra godeti* infested by *Distoma*; SUTER, (428) p. 95.—Boring sponge of the oyster is *Cliona celata*, Grant; LEIDY, P. Ac. Philad. 1891, p. 122. —*Algæ* perforating the shells of *Mollusca*; BORNET, E., & FLAHAULT, C. Sur quelques Plantes vivant dans le test calcaire des Mollusques; Bull. Soc. Botanique de France, xxxvi (1890), pp. cxlvii-clxxvi, 12 pls. [abstr. Nature, xliii, p. 185].

### 14. ECONOMICS.

Edible [marine] *Mollusca* of Western North America; HEMPHILL (178).—Edible *Mollusks* of Rhode Is.; CARPENTER, H. F., Naut. iv, p. 137 (criticised in vol. v, p. 4).—"Edible shell notes"; STEARNS, Naut. v,

p. 26.—Mollusks in the Portland, Oregon, market; DORE, *Naut.* v, p. 58.—*Mollusca* of the San Francisco markets; KEEP (213).—Edible Mollusks of Maine (U.S.); WINCKLEY, *Naut.* iv, pp. 112.—<sup>2</sup>Oysters, and all about them . . . . By J. R. PHILPOTS. London: 1891.—<sup>3</sup>The Oyster: a popular summary of a scientific study. By Prof. W. K. BROOKS. Baltimore and London: 1891.—Oyster culture at Roscoff; LACAZE-DUTHIERS (226 & 227).—Oyster culture in Brittany, &c.; BOUCHON-BRANDELY (34): see also smaller notes in the same *Revue*.—Oyster question in America; MARTIN, H. N., Johns Hopk. Univ. *Circ.* x, pp. 58 & 59, and *Science*, 1891, pp. 169 & 170.—Oysters and oyster fisheries of Queensland; KENT (214A).—Oysters at the Antipodes; KENT, *Nature*, xlv, pp. 43–45.—Pearl Fisheries of Ceylon; VANE, J. A. S. (Ceylon), x, pp. 14–40.—Shell-money; RICKARD, *P. R. Soc. Vict.* iii, p. 46.

### 15. COLLECTION, PRESERVATION, ARRANGEMENT, MUSEUMS, &c.

Methods employed at the Zoological Station at Naples for the preservation of marine animals; LO BIANCO, *Bull. Sci. Fr. Belg.* xxiii [*Mollusca*], pp. 137–141.—Preservation; GROULT, *Le Nat.* 1891, p. 185.—Drawings of shells should be made by projection; NICOLAS (303).—Museum arrangement: MOTT (F. T.) on the development of Museums; *Tr. Leicester. Soc.* ii, pp. 157–159, and *diag.*—British Museum (*Natural History*): Catalogue of Fossil *Cephalopoda*; FOORD (126): Catalogue of Eocene and Oligocene *Mollusca* of the Edwards Collection; NEWTON (298).—York Museum, list of figured specimens of fossil *Mollusca*; *Rep. Yorks. Phil. Soc.* 1890, pp. 64–79.—Lisbon Museum: Catalogue of *Cephalopoda*; GIRARD, *J. Sci. Lisb.* II, i, p. 233, & ii, p. 33.—Wiesbaden Museum: Catalogue of the Conchological Collection; ROEMER (367).—Catalogue of his collection; PAETEL (312).—Catalogue of the collection of M. DE SAINT-SIMON (377).

## III.—DISTRIBUTION.

### GEOGRAPHICAL.

#### NON-MARINE MOLLUSCA.

Geographical distribution of slugs; COCKERELL (62).

#### a. PALÆARCTIC ZONE.

*Acephala*; WESTERLUND (459).

#### 1. Septentrional Region.

British Isles: Nomenclature of certain British genera; SMITH (413).—British non-marine and the Glacial Period; QUILTER, *Conchologist*, 1891, p. 18.—Food and eggs of some British species; GAIN (140, 140A).—Dorsetshire: *Helix pisana*, *Vertigo moulinsiana*, and *Acme lineata* recorded and list of Molluscan fauna given; CAMBRIDGE (55): occurrence of

*Vertigo moulinsiana* ; STANDEN (416).—Essex : additions and corrections to list of non-marine *Mollusca* of Bishop's Stortford ; INGOLD (195).—Kent : *Helix elegans* at Dover ; COX (81).—Lancashire : local *Mollusca* of Liverpool ; HIGGINS (184).—Oxfordshire : list of species, with notes ; COLLINGE (70).—Suffolk : catalogue of recorded species ; GREEN (155).—Sussex : list ; JENNER (199).—Yorkshire : annotated list ; NELSON & TAYLOR (295).

Scotland : list ; ROEBUCK (366).—Scotch species of *Vertigo* ; *V. concinna* = *levenensis*, n. sp. ; SCOTT (390).

Ireland : slugs ; SCHARFF (380).—Non-marine *Mollusca* of Achill I. ; MILNE (281).

Europe : European forms of *Conulus* ; BOURGUIGNAT (35).

France [see also 2] : rare *Helices* ; GRANGER (151).—Molluscan fauna of Sarthe ; MORIN (289).—*Lymnaea crassilabrum*, n. sp. ; FOLIN (124).—Alleged new species of *Unio* and of *Anodonta* ; BAICHÈRE (7).

Germany : SIMROTH (396).—Brunswick : list of 110 species ; KOCH (223).—Neumark (W. Prussia) : rare shells ; MARTENS (254).—Saxony : occurrence of *Helix obvia* ; GOLDFUSS (149).—Spiekerooge Is. (mouth of the Weser) : fauna includes *Limax agrestis* and *Arion empiricorum* ; POPPE, Abh. Ver. Brem. xii, p. 60.—Westphalia : lists ; LOENS (238).—Wurtemberg : anatomy of species of *Planorbis* ; BUCHNER (50).—*Anodonta suevica*, n. sp., from the Neckar ; KOBELT, in ROSSMAESSLER (369).

Switzerland : list, with notes, of 79 land and 13 freshwater *Mollusca* in the Cantons of Appenzel and St. Gallen ; MARTENS (258).

Russia : *Anodonta borealis*, n. sp., from the Ohta ; KOBELT, in ROSSMAESSLER (369).

## 2. Circum-Mediterranean Region.

Spain, Portugal, and Balearic Is. : Molluscan fauna, with full bibliography ; HIDALGO (183).—Portugal : description and anatomy of the slugs (*Agriolimax immaculatus* and *Geomalacus oliveira*, n. spp.) ; SIMROTH (397).—Spain : *Mollusca* of Catalonia, 9 new species [?] ; BOFILL (32).

France [see also 1] : Basses-Pyrénées, *Cryptazeca monodonta* near Bayonne ; FOLIN (125).—Aude : Molluscan fauna of Mont Alaric ; FAGOT (109).—Hautes-Pyrénées : catalogue of the *Mollusca* of La Barousse ; GOURDON (150).—Bouches-du-Rhône : *Planorbis salomensis*, n. sp. ; FLORENCE (123).—Rhône Riv. : *Anodonta culoxiana* [= *A. cygnea*] ; NICOLAS (302).

North Africa : Algiers and Tunis, 2 new species *Helix*, 7 new species *Buliminus* ; KOBELT, in ROSSMAESSLER (369).—Algiers : recent and sub-fossil species from the Sahara ; ROLLAND (368).—Algiers : *Limacidae*, 13 species, and *Amalia cabiliana*, n. sp., POLLONERA (479).—S. Algiers : *Mollusca*, with 3 new species ; FISCHER, in DYBOWSKI (103).—Lampedusa Is. : *Helix lampedusa*, n. sp. ; KOBELT, in ROSSMAESSLER (369).—Tripoli : on *Helix quedenfeldti*, v. Mart. ; KOBELT (221).

Egypto-Syrian : Egypt, *Chambardia*, n. g., with 5 new species ; BOUR-

GUIGNAT, in SERVAIN (391): Syria, *Gabillotia locardi*, n. g. & sp., Lake of Antioch; SERVAIN (391).

Levant: *Clausilia* from Greece, the Coast of Asia Minor, and the intervening islands, 9 new species; BËTTGER (28).—Crete: *Helix akrotirensis*, n. sp.; KOBELT, in ROSSMAESSLER (369).—Cerigo Is.: *Zonites cytherea*, n. sp.; MARTENS (253).—Calymnos Is.: *Helix valentini*, n. sp.; KOBELT, in ROSSMAESSLER (369).

Greece: list of 33 species, *Helix krueperi*, n. sp.; BËTTGER (30).—Hydra Is.: 5 species; *id.* (31).—Slugs, with 4 new species; SIMROTH (398).—Bosnia, *Helix blauti*, n. sp.; KOBELT, in ROSSMAESSLER (369).—Austro-Hungary: list of species of *Clausilia* near Prague; BLAŽKA (22).—Krain, *Lithoglyphus gredleri*, n. sp.; KOBELT, in ROSSMAESSLER (369).—Styrian *Gastropoda*; PFEIFFER (327).—Trensin [N. E. of Vienna]: list of *Mollusca*, 4 new species; BRANCSIK (41).—Transylvania, 7 new species and many "varieties"; KIMAKOWICZ (215).—Italy: Modena, list of *Mollusca* and *Paludinella fraulucciae*, n. sp., from Mantua; PICAGLIA (329).—Tuscany: Monte Argentario, *Helix talamonica*, n. sp.; KOBELT (220).—Sicily: *Helix caltabellotensis*, n. sp.; KOBELT, in ROSSMAESSLER (369).—Malta: *Helix gattoi*, n. sp.; KOBELT, in ROSSMAESSLER (369).—*Limacidae*, 4 species, and *Agriolimax caruanae*, n. sp.; POLLONERA (478).

### 3. Central Asiatic Region.

Turcomania: *Macrochlamys schmidtii*, n. sp.; BRANCSIK (43).—Turkestan: *Buliminus ferghanensis* and *B. komarowi*, n. sp.; KOBELT, in ROSSMAESSLER (369).

### 4. Chinese Region.

China: geographical distribution, with 16 new species from Formosa; SCHMACKER & BËTTGER (386): notes; GREDLER (153): land *Mollusca* with *Vaginula*, 4 new species, *Rathousia pantherina*, n. g. & sp., and *Helicarion*, 5 new species; HEUDE (477).—China? *Unio provancheriana*, n. sp. [afterwards proved to be from Canada]; PILSBRY (340).—North China: *Macrochlamys stearnsi*, n. sp.; PILSBRY (334).—Hainan, Is. of; FISCHER (119).

### 5. Japanese Region.

Japan: geographical distribution; SCHMACKER & BËTTGER (386).—Japan (?): *Buliminus extorris*, n. sp.; BRANCSIK (43).—Bonin Is. is the correct locality for *Helix mandarina*, Gray; SMITH (414).

### 6. Atlantidean Region.

Azores: description and anatomy of the slugs; SIMROTH (397): List of species collected at Fayal Is.; RUSH (372).—Madeira: list of species collected; RUSH (372).—Canaries: Terrestrial species; DAUTZENBERG (95).



## b. PALEOTROPICAL AFRICAN ZONE.

## 7. Central African Region.

E. Africa : remarks on the Molluscan fauna of British Central Africa; SMITH (404) : *Mollusca* of the Emin Pascha expedition, *Buliminus trichrous*, n. sp.; MARTENS (248).—Tanganika: *Neothauma*; SMITH (411) : *Ponsonbya leucoraphe*, n. g. & sp., from Lake Tanganika; ANCEY (3).

## 8. West African Region.

Old Calabar: *Ennea anceyi*, n. sp.; ANCEY (2).—Cameroons : species collected by Herr Preuss, *Streptostele subangusta*, n. sp.; MARTENS (250).—Congo, *Lanistes congicus*, n. sp.; BETTGER in SCHEPMAN (382) : *Unio landanensis*, n. sp.; SCHEPMAN (383) : *Cyrenoida rhodopyga*, n. sp.; MARTENS (249).

## 9. South African Region.

MELVILL & PONSONBY (278), 9 new species : *Unionidæ*; SMITH (411) : 3 new species; ANCEY (2).—Natal: *Urocyclus pallescens*, n. sp.; COCKERELL (63).—Damaraland, 3 new species; ANCEY (2).

## 10. Malagasy Region.

Madagascar : 5 new species; ANCEY (3).

## 11. Afro-Arabic Region.

Aden and Perim Is. : terrestrial *Mollusca*, with 3 new species; JOUSSEAUME (206).—Massowah : *Vertigo hermosa* and *Zua thalassina*, n. spp.; JOUSSEAUME (206).

## c. PALEOTROPICAL ORIENTAL ZONE.

## 12. Indian Region.

Descriptions of 6 new species; BEDDOME (15).

## 13. Indo-Chinese Region.

Indo-China : Catalogue containing 662 non-marine species, with details of their distribution; FISCHER (116) : 9 new species; MORLET (290, 291).—Pegu : *Girasia affinis*, n. sp.; COCKERELL (63).—Perak : land-shells, with 6 new species; MOELLENDORFF (286).—Siam: *Ibycus siamensis*, n. sp.; COCKERELL (63).—Laos : *Calybium massiei*, n. g. & sp.; MORLET (292).—Cambodia : *Vaginula hennigi*, n. sp.; SIMROTH (399).

14. *Indo-Malay Region.*

Dutch E. Indies: land *Mollusca*, with table of their distribution and 12 new species; MARTENS (246).—Malay Archipelago: notes on the *Mollusca*; MARTENS (252).—Sumatra: land *Mollusca*, list and 2 new species; MARTENS (246).—Java: list of land *Mollusca*; MARTENS (246): *Mollusca* collected by Strubell; BËTTGER (29).—Flores Is.: land *Mollusca* and 3 new species; MARTENS (246).—Timor: list of land *Mollusca*; MARTENS (246).—Borneo: list of land *Mollusca*; MARTENS (246): *Zonitida*, 1 n. g., 1 n. subg., and 13 new species, and *Helicida*, 7 new species; GODWIN-AUSTEN (147): *Unio semmelinki*, n. sp.; MARTENS (252).

15. *Philippine Region.*

Philippines: fauna, with 6 new species; HIDALGO (183): criticism of Hidalgo; MOELLENDORFF (284): 11 new species; MOELLENDORFF (283): *Cochlostyla*, 4 new species; PILSBRY, in TRYON (443): *Paludomus palawanicus*, n. sp.; BROTH (47).

## d. AUSTRALIAN ZONE.

16. *Austro-Malayan Region.*

Dutch E. Indies: land *Mollusca*; MARTENS (246).—Celebes: list of land *Mollusca*, *Alycaeus celebensis*, n. sp.; MARTENS (246).—Saleyer Is.: 5 new species; *id.* (246).—Sangir Is.: *Cyclotus atratus*, n. sp., and *Helix*, 2 new species; ANCEY (2).—Moluccas: *Mollusca* collected by Strubell, 25 new species; BËTTGER (29): *Helix chariessa*, n. sp.; PILSBRY, in TRYON (443).—New Guinea: *Rhytida globosa*, n. sp.; HEDLEY (170): 3 new species of *Helix*; SMITH (410): *Helix rohdei*, *H. lepidophora*, *H. delphax*, n. spp.; KOBELT (222): *Helix agnocheilus*, n. sp., Brit. New Guinea; SMITH (407).—British New Guinea: list with 24 new species; HEDLEY (172).—Torres Straits: land shells; SMITH (408).—New Britain, *Helix heimbürgi*, n. sp.; BRANCSIK (43).—Entrecasteaux Group: rectification of list; SMITH (409).—Woodlark Is.: list of 8 species, including *Helicina woodlarkensis*, n. sp.; *id.* (409).—Solomon Is.: *Helix amphizona*, n. sp.; PILSBRY, in TRYON (443): *Placostylus mendance*, n. sp.; KOBELT, in MARTINI & CHEMNITZ (260): *Placostylus guppyi*, n. sp.; SMITH (407).

17. *Australian Region.*

List of species introduced; MUSSON (294).—Queensland: *Vaginula leydigi* and *V. hedleyi*, n. spp.; SIMROTH (399).—New South Wales: Bourke, *Helix bourkensis*, n. sp.; SMITH (409).—Tasmania: list of species; JOHNSTON (204): anatomy of some Tasmanian snails; HEDLEY (171).

18. *Austro Polynesian Region.*

Aura Is. (New Hebrides): *Placostylus hartmanni*, n. sp. ; KOBELT, in MARTINI & CHEMNITZ (260).—New Caledonia: *Placostylus*, 10 new species ; KOBELT, in MARTINI & CHEMNITZ (260) : *Placostylus layardi*, *P. smithi*, n. spp. ; KOBELT (219).—Viti Is. : *Placostylus*, 2 new species ; KOBELT, in MARTINI & CHEMNITZ (260).

19. *Polynesian Region.*

Caroline Is. : *Pupina brencleyi* and *Omphalotropis carolinensis*, n. spp., from Lugunor Is. ; SMITH (407).—Hawaian Archipelago : 5 new species ; ANCEY (3).—Hawaii : list of some land shells [*Helicter*] ; LYONS (241).

20. *Neozelanian Region.*

List of species introduced ; MUSSON (294).—New Zealand : 24 new species ; SUTER (428) : miscellaneous notes ; *id.* (429) : *Neojanella*, n. g., *N. dubia*, n. sp., from Cook's Straits ; COCKERELL (62).—Lord Howe I. : list of 24 species ; FISCHER (120), HEDLEY (175) : thickened variety of *Bulimus varicosus* ; ETHERIDGE (108).

## e. NEANTARCTIC ZONE.

[None.]

## f. NEOTROPICAL ZONE.

23. *Peruvian Region.*

Galapagos Is. : addition to the terrestrial Molluscan fauna ; DALL (93).

24. *Columbian Region.*

Ecuador : *Porphyrobaphe galactostoma*, n. sp. ; ANCEY (2).—Cayenne : *Helix catenulata*, n. sp. ; ANCEY (2).

25. *Brazilian Region.*

Amazon Riv. : *Ampullaria petiti*, n. sp. ; CROSSE (84).—Brazil : *Anctus pilsbryi*, n. sp. ; FORD (130) : distribution of *Ampullaria* in Southern Brazil ; JHERING (201) : *Castalina*, n. g., with 2 new species ; JHERING (202).

26. *Mexican Region.*

Lower California : COOPER (76).—Vera Cruz : *Amnicola orizabensis*, n. sp. ; CROSSE & FISCHER (85).—Mexico : 3 new species ; PILSBRY (341).—Yucatan and Mexico : 3 new species and some new varieties ;

PILSBRY (332).—Central America : *Cyclophoridae* (*Diplommatina stoll*i, n. sp.), *Helicinidae* (*Helicina*, 3 new species), *Stylommatophora agnatha* (*Strebelia*, *Glandina*, *Salasiella* and *Streptostyla*, pars); MARTENS (247) : *Cyclophoridae* (finis) to *Melaniidae* (pars); FISCHER & CROSSE (121).—Guatemala : *Pachychilus indifferens*, n. sp.; CROSSE & FISCHER (85) : *Pachychilus subexaratus*, n. sp.; CROSSE & FISCHER (86).

### 27. *Caribbean Region.*

West India Is. : list of species collected; RUSH (371).—Bahamas : *Helix maynardi* and *H. xanthophaes*, n. spp.; PILSBRY (334).—Cuba : *Vertigo cubana*, n. sp.; DALL (88).—Jamaica : list of species collected in the eastern part; JOHNSON & FOX (203).—San Domingo : complete monograph, with notes on all the species of non-marine *Mollusca* (*Rolleia*, n. g.); CROSSE (83).—Porto Rico : MARTENS (257).—Barbados : list of 31 species, of which 5 are peculiar; SMITH & FEILDEN (415).

### g. NEARCTIC ZONE.

### 28. *American Region.*

United States : list, with notes on some species; STEARNS (419) : notes on familiar Mollusks; BEAUCHAMP (14) : classification of American land snails; PILSBRY (339) : new species of *Hyalina*; DALL (90) : occurrence of *Mesodon sayii*; WALTON (454) : forms of *Carychium*; PILSBRY (337) : sculpture of *Limnaeus*; STEARNS (421) : means by which *Unionidae* are distributed in the S. E. States; SIMPSON (394).—Arkansas : 2 new species of *Unio*; MARSH (243).—Florida : list of species collected at Pensacola; RUSH (371) : 2 new species of *Unio*; MARSH (244).—*Unionidae* in S. Florida; WRIGHT (474).—Illinois : *Mollusca* of Thompson's Lake; STRODE (425) : Mollusks of Spoon River; STRODE (426).—Massachusetts : *Mollusca* from Nantucket; PILSBRY (333).—New Jersey : Molluscan fauna of Gloucester County; FOX (132).—Pennsylvania : shells of Western Pennsylvania; HARN (166).—Texas : notes on *Unionidae*; PILSBRY (344).

### 29. *Californian Region.*

West coast of U. S. : ORCUTT (310), HEMPHILL (178) : 5 new species; STEARNS (418).—California : *Sphaerium raymondi*, n. sp.; COOPER (76).—San Francisco : list of species in San Francisco County; WOOD & RAYMOND (471).

### 30. *Canadian Region.*

Canada : *Unio provancheriana*; PILSBRY (340).—British Columbia : slugs; COCKERELL (68).—Vancouver Is. : list of land-shells; TAYLOR (434).

## MARINE MOLLUSCA.

## 1. Arctic Province.

Behring Sea : *Mollusca* of the Albatross ; DALL (89).

## 2. Boreal Province.

Norway : *Modiola gigantea*, n. sp. ; CLESSIN, in MARTINI & CHEMNITZ (264).

## 3. Celtic Province.

Baltic : Molluscan larvæ ; Ber. Komm. wiss. Unters. deutsch. Meere vi, p. 115.—Britain : British specimen of *Illex eblanæ* ; HOYLE (193).—St. Andrew's Bay : additions to the fauna ; HOLT (191).—Thames Estuary : distribution of *Mollusca* in ; JENKINS & GROCOCK (198).—English Channel : *Mollusca* of the French coast, 14 new species ; LOCARD (233) : *Pleurophyllidia loveni* off the Eddystone ; CUNNINGHAM (87) : a species of *Hancockia* at Plymouth ; GAMBLE (142).—*Mollusca* taken near Falmouth in 1891 ; VALENTIN, Rep. R. Cornwall Polytechn. Soc. 1891, pp. 97 & 98.—Scilly : Marine shells ; BURKILL & MARSHALL (54).—North Wales : list of marine shells, 135 species ; GREENE (154).

## 4. Lusitanian Province.

France : *Mollusca* of the French coast, 21 new species ; LOCARD (233) : critical study of Michaud's types ; LOCARD (235) : French species of the genus *Euthria* ; LOCARD (237) : *Mactra bourguignati* and *M. gracilis*, alleged new species ; LOCARD (236) : *Ovulideæ* and *Cypræideæ* of the coast of the Dept. du Var ; MOLLERAT (287).—Gulf of Gascogne : Molluscan fauna ; DAUTZENBERG (96).—Banyuls : anatomy of 9 species (including 2 new genera and 7 new species) of *Neomeniideæ* ; PRUVOT (357).—Roussillon : monograph continued ; BUCQUOY, DAUTZENBERG & DOLLFUS (53).—Spain and Portugal : DAUTZENBERG (95).—Spain, Portugal, and Balearic Is. : Molluscan fauna ; HIDALGO (183).—Mediterranean : shells ; GREGORIO (157) : *Chtenopteryx fimbriatus*, n. g. & sp., and *Callioteuthis reversa*, first recorded ; APPELLÖF (5) : *Neomenia* ; PRUVOT (356) : living and fossil shells, especially of the groups *Murex brandaris* and *M. trunculus* ; GREGORIO (158) : living and tertiary forms of *Fissurella*, *Emarginula*, and *Rimula* ; GREGORIO (160) : relationship of the Mediterranean fauna with that of the Red Sea ; SMITH (405).—Gulf of Naples : species of *Pleurobranchus* ; MAZZARELLI (271).—Azores : list of species collected at Fayal Is. ; RUSH (372).—Madeira : list of species collected ; RUSH (372), WATSON (456).—Canaries : list of *Mollusca* ; DAUTZENBERG (95).

5. *Aralo-Caspian Province.*

[None.]

6. *West African Province.*

List of *Mollusca* from Senegal, 4 new species; DAUTZENBERG (95).—Loanda : *Arca dunkeri*, n. sp.; KOBELT, in MARTINI & CHEMNITZ (263).

7. *South African Province.*

Cape : *Lampusia murrayi*, n. sp.; SMITH (405) : *Patella patriarcha*, n. sp.; PILSBRY, in TRYON (442).—Natal : *Glyphis crucifera*, n. sp. [= *Fissurella cruciata*, KRAUSS, non Gould]; PILSBRY, in TRYON (442) : *Peristernia leucothea*, n. sp.; MELVILL (275).

8. *Indo-Pacific Province.*

Zanzibar : New parasitic Mollusc, *Entovalva mirabilis*; VOELTZKOW (448).—Madagascar : *Peristernia mannophora*, n. sp.; MELVILL (275).—Nossi-Bé Is. : *Nassa freyi* and *Atys freyi*, n. spp.; BRANCSIK (43).—Mauritius : *Conus worcesteri*, n. sp.; BRAZIER (45) : *Peristernia*, 5 new species; MELVILL (275).—Red Sea : *Crenatula reeveana*, n. sp.; CLESSIN, in MARTINI & CHEMNITZ (262) : *Emarginula nestæ*, *Helcioniscus eucosmia*, n. spp.; PILSBRY, in TRYON (442).—List, with 9 new species, of forms from Aden, and remarks on the connection of the Red Sea fauna with that of the Mediterranean; SMITH (405).—Aden : 10 new species; JOUSSEAUME (206).—Suez : marine conchology, recent and fossil; VASSEL (444).—Persian Gulf : list of 33 species, collected by F. Houssay; FISCHER, F. (111).—Ceylon : *Cephalopoda*, including 3 new species; ORTMANN (311).—Bay of Bengal : 3 new and many undetermined species of deep-sea *Mollusca*; WOOD-MASON & ALCOCK (472).—Indo-China : catalogue containing 480 species, with details of their distribution; FISCHER (116).—Java : *Mollusca* collected by Strubell; BÆTTGER (29) : *Nassa javana*, n. sp.; SCHEPMAN (384).—Philippines : fauna; HIDALGO (183) : 6 new species *Minolia*; MELVILL (277).—Moluccas : *Mollusca* collected by Strubell; BÆTTGER (29) : *Conus jousseaumei*, n. sp.; COUTURIER (80) : *Oliva cryptospira*, n. sp.; FORD (130) : *Pinna mollucensis*, n. sp.; CLESSIN, in MARTINI & CHEMNITZ (262).

Queensland : oysters and oyster fisheries; KENT (214A) : experimental cultivation of *Meleagrina*; KENT (214).—Magnetic I. : *Minolia henniana*, n. sp.; MELVILLE (277).—Thursday I. : *Liotia calliglypta*, n. sp.; MELVILLE (277).—Torres Straits : *Columbarium distephanotis*, n. sp.; MELVILLE (277).—New Caledonian Archipelago : *Stomatella lyrata* and *Emarginula souverbiana*, n. spp.; PILSBRY, in TRYON (442).—Viti Is. : *Acmæa garretti*, n. sp.; PILSBRY, in TRYON (442).—Sandwich Is. : *Peristernia selina*, n. sp.; MELVILLE (275) : *Emarginula subclathrata*, n. sp.; PILSBRY, in TRYON (442).—Iniuë [Savage] Is. : *Peristernia iniuensis*, n. sp.; MELVILLE (275).

9. *Australo-Zelandic Province.*

Australia : descriptions of 12 new species ; TATE (430) : supplemental list of Lamellibranchs ; *id.* (431) : 3 new species ; BAKER (10) ; *Helcioniscus eucosmia*, n. sp. ; PILSBRY, in TRYON (442) : *Pectens* confused with *P. laticostatus*, 1 new species ; TATE (432) : *Perna novohollandiae*, n. sp. ; KÜSTER, in MARTINI & CHEMNITZ (262) : *Modiola angasi*, n. sp. ; CLESSIN, in MARTINI & CHEMNITZ (264).—Victoria : *Conus segravei*, n. sp. ; GATLIFF (143).—New South Wales : 5 new species ; SMITH (407) : 21 new species from Challenger Station 164 B., off Sydney ; SMITH (406) : *Eulimella moniliforme*, n. sp. ; HEDLEY & MUSSON (177).—Ballina (N.S.W.) : *Scalaria ballinensis*, n. sp. ; SMITH (409).—Tasmania : list of species ; JOHNSTON (204) : *Trochidae*, &c. ; BRAZIER (44).—Lord Howe Is. : list of 76 species ; FISCHER (120).—Chatham Is. : *Acmæa chathamensis*, n. sp. ; PILSBRY, in TRYON (442).

10. *Japonic Province.*

Japan : list ; STEARNS (417) : *Fusus sieboldi*, n. sp. ; SCHEPMAN (381) : *Tritonidea undulata*, n. sp. ; SCHEPMAN (384) : *Purpura problematica*, n. sp. ; BAKER (10) : *Solarium enoshimense*, n. sp. ; MELVILL (277) : *Trochus abyssorum* and *Cuspidaria lischkei*, n. spp. ; SMITH (406) : *Stomatella lyrata*, *Helcioniscus stearnsii*, and *H. eucosmia*, n. spp. ; PILSBRY, in TRYON (442) : *Patella stearnsii*, n. sp. ; PILSBRY (336) : *P. boninensis*, n. sp. ; PILSBRY (345) : *Pinna lischkeana*, n. sp. ; CLESSIN, in MARTINI & CHEMNITZ (262).

11. *Aleutian Province.*

*Mollusca* of the 'Albatross' from coasts of Alaska and Brit. Columbia, with 1 n. g. and 13 new species ; DALL (89).

12. *Californian Province.*

*Mollusca* of the 'Albatross' from W. coast of U. S., with 7 new species ; DALL (89).—West coast of North America : 1 n. subg., 6 new species ; STEARNS (418).—West coast of U. S. ; ORCUTT (310) : edible *Mollusca* ; HEMPHILL (178).—San Francisco County : list of species ; WOOD & RAYMOND (471).—Monterey Bay : *Scaphella arnheimi*, n. sp. ; RIVERS (364).—Lower California : *Fisurella rubropicta*, n. sp. ; PILSBRY, in TRYON (442).

13. *Panamic Province.*

Gulf of California : *Acmæa dalliana*, n. sp. ; PILSBRY, in TRYON (442).—S. America, W. Coast : list of species from between 7° 30' S., and 8° 49' N. ; STEARNS (420).

14. *Peruvian Province.*

Chili : *Fissurella punctatissima*, n. sp. ; PILSBRY, in TRYON (442).

15. *Magellanic or Antarctic Province.*

S. Patagonia : *Oapulus compressus*, n. sp. ; SMITH (406).—Kerguelen Is. : *Turritella incolor*, n. sp. ; SMITH (406).

16. *Patagonian Province.*

[None.]

17. *Caribbean Province.*

Florida, U. S. : list of species collected at Pensacola ; RUSH (371).—Mexico, Southern : BAKER (8).—West India Is. : list of species collected ; RUSH (371) : *Acmæa carpenteri*, *Emarginula magnifica*, n. spp. ; PILSBRY, in TRYON (442).—Tobago Is. : *Pleurotomaria adansoniana* ; GUPPY (164).—Curaçoa Is. : *Latirus eppi*, n. sp. ; MELVILL (275, 276).—Brazil : *Mollusca* from the Southern Coast ; DALL (92) : *Eutivela*, n. subg., with 2 new species ; DALL (91).

18. *Transatlantic Province.*

*Mollusca* of the Atlantic coast ; AP-GAR (4).

## GEOLOGICAL.

List of the known fossil forms from Madagascar ; Ant. Annual, xiv, pp. 242–244.

## 1. QUATERNARY.

Recently extinct Molluscan fauna of the Sahara ; FISCHER (117), ROLLAND (368).—Subrecent fauna at Mähren ; RŽEHÁK (374).—Quaternary of S. Flavia ; MONTEROSATO (288) : of Baume d'Hostun (Drôme), 2 new species ; LOCARD (234).—Land *Mollusca* in deposits of the Vladimir and Nizhnee-Novgorod districts, Russia ; SIBIRTZEV, Rev. Sci. Nat. St. Petersb. 1891, p. 40.—Pleistocene *Mollusca* of Mähren ; RŽEHÁK (375).—Pleistocene land-shells at Gozo ; COOKE, Med. Nat. i, pp. 10 & 20.—Lists of Pleistocene *Mollusca* of Scotland ; SCOTT (389).—Post-pliocene of Balestrate (Sicily) ; GREGORIO (156).

## 2. TERTIARY.

Land-shells in the volcanic tuf of Limbourg ; BLEICHER (23).—Tertiary of Bohemia, with 2 new species of non-marine shells ; KLIKA (217).—*Mollusca* from the newer Tertiaries of Szegedin : *Unio szegedensis*, n. sp. ;



HALAVÁT (165).—Tertiary non-marine *Mollusca* of Switzerland, 6 new species ; MAILLARD (242).—Tertiary of Turin, with Middle Lias fossils ; PARONA (313).—Tertiary *Mollusca* of Piedmont, with 58 new species and innumerable "vars." ; SACCO (376).—Tertiary forms of *Fissurella*, *Emarginula*, and *Rimula* ; GREGORIO (160).—Tertiary *Mollusca* from the Algerian Sahara ; ROLLAND (368).—Tertiary fauna of Suez ; VASSEL (444).—Tertiary fauna of the Grand Canary, 1 n. g., 8 new species ; ROTHPLETZ & SIMONELLI (370).—Distribution of *Dreysensia* and *Congerina* (1 new species) ; OPPENHEIM (309).

Neogene deposits of Greece, 6 new species (freshwater) ; OPPENHEIM (308).—Neogene fossils in the Zurich Museum, 24 new species ; MAYER-EYMAR (269).—New species of *Ostrea* from the Molasse of Switzerland ; *id.* (268).—Rognacien of Baux and St. Remy, with 10 new species ; CAZIOT (58).

Pliocene : *Cardium præapiliosum*, n. sp., from Altvilla ; GREGORIO (158) : *Pleurotoma antverpiensis* and *Hædropleura delheidi*, n. spp., and two other forms ; VINCENT (447) : *Sepia bertii* from the Lower Pliocene of the Bolognese ; FORESTI (131).—Lower Pliocene of Borzoli, with 4 new species ; CAMPANA (56).

Miocene : 5 new species of land *Mollusca* from the Upper Miocene near Regensburg ; FLACH (122) : *Leiopyrga quadricingulata*, n. sp., from the Australian Miocene ; TATE (430) : *Gastropoda* from the Austro-Hungarian Miocene, 64 new species ; HOERNES & AÜINGER (190) ; *Mollusca* from the Calcare di Acqui (Alto Monferrato) ; TRABUCCO (440) : occurrence of the genus *Clavatula* in the Miocene of Austro-Hungary, with new forms ; HOERNES (186) : occurrence of the genus *Clinura* in the same ; *id.* (187) : occurrence of the genus *Pseudotoma* in the same ; *id.* (188) : occurrence of the genera *Roualtia*, *Dolichotoma*, and *Oligotoma* in the same ; *id.* (198) : 5 new species, non-marine, from the Lower Miocene of Reun in Steiermark ; PENECKE (325) : *Pupa diezi*, n. sp., from the Miocene of Bohemia ; FLACH (122).

Oligocene : marine fauna from the neighbourhood of Etampes, 5 new species ; COSSMANN (78) : Oligocene of Termini-Imerese (Sicily), 9 new species ; CIOFALO (60) : *Gastropoda* from the Lower Oligocene of North Germany, 125 n. spp. ; KOENEN (224) : list of British Oligocene and Eocene *Mollusca* in the Edwards Collection, in the British Museum (1229 species and 585 MS. names) ; NEWTON (298) : lists of Oligocene and Eocene *Mollusca* of the Paris Basin (15 new names) ; HARRIS & BURROWS (168).

Eocene : Eocene non-marine shells of Venetia ; GREGORIO (159) : *Leiopyrga sayceana*, n. sp., Australia ; TATE (430) : Nummulitic beds of Egypt, list of the *Vulsellæ* and of the *Mytili* ; MEYER-EYMAR (266, 267).

### 3. SECONDARY.

Secondary fossils from Mexico, 1 n. g., 28 new species ; FELIX & LENK (110) : *Luvina* ? *townsendi*, Straits of Magellan ; WHITE (462).

Cretaceous: DANIEL of Saint-Remy, 17 new species; NICOLAS (304): Cretaceous fossils of Upper Bavaria, near Siegsdorf, 48 new species; BOEHM (27): Cretaceous *Cephalopoda* from Spain, 5 new species; NICKLÈS (301): Sénonian of Friuli, 8 new species; TOMMASI (438): Cretaceous *Mollusca* from the Algerian Sahara; ROLLAND (368): Cretaceous *Pelecypoda* from the Highlands of Tunis, 33 new species; PERON (326): Cretaceous fossils from Syria, with 41 new species; BLANCKENHORN (21): 2 new genera and 55 new species from the Cretaceous of Syria; WHITFIELD (467): Cretaceous fossils of Shikoku, Japan, with 3 new species of *Trigonia*; YOKOYAMA (475): 3 new species from the Cretaceous of Texas; HILL (185): young shells of *Baculites compressus*, Say, from the Cretaceous of Dakota; BROWN (48): Cretaceous fauna of the Argentine Republic; BEHRENDSEN (16): *Ammonites* from the Upper Cretaceous of France, 3 new species; SEUNES (232): *Ammonites julianyi*, n. sp., from the Lower Cretaceous of the Basses Alpes; BASTIDE (13): Sénonian *Hippurites* revised by TOUCAS (439): *Rudistes* from the Upper Chalk of the northern borders of the Harz; MUELLER (293): *Guilfordia waageni*, new form, from the Chalk of Bohemia; JAHN (197): Neocomian *Ammonites* of the Crimea; KARAKASHI (212): *Ammonites* from the Barremien of Djebel-Ouach, 9 new species; SAYN (379).

Speeton Clay: 7 alleged new species of *Belemnites*; PAVLOW (316).

Jurassic, Russia: 2 new species of *Belemnites*; PAVLOW (316): *Cephalopoda* from Popielan, 2 new species named, and several new undetermined forms; SIEMIRADZKI (393): Jurassic *Mollusca* of Orenburg and Samara; SINTZOV (402): Callovian of Western France, with 4 new species of *Ammonites*; GROSSOUVRE (163).

Oolite: *Pelecypoda* from the Lower Corallian of the Bernois Jura, 3 new genera and 43 new species; LORIOL (239): *Ammonites* from the Inferior Oolite of the British Is., 1 n. g., 9 new species; BUCKMAN (51): *Gastropoda* of British Inferior Oolite, 8 new species; HUDLESTON (194).

Northampton Sands: occurrence of *Ammonites jurensis*; NEWTON (297).

Lias: of Longobucco, Molluscan fauna, 8 new species; FUCINI (138): the *Ammonites* of the Middle Lias of Oestringen (*Cycloceras subarietiforme*, n. sp.); FUTTERER (139): *Arietites* from the Lower Lias of the N. E. Alps, 2 new species; WAEHNER (450): Middle Lias fossils in Tertiary beds of Turin; PARONA (313): fauna of the Lias and Tithonian of the Argentine Republic, 17 new species; BEHRENDSEN (16).

Trias: *Gastropoda* of St. Cassian beds, with many new species; KITTL (216): *Conchodus* from the Alpine Trias; TAUSCH (433): 2 new genera, 1 n. subg., and 14 new species from Asia Minor; BITTNER (19): *Trematodiscus jugatonodosus*, n. sp., from the Lower Keuper of Thuringen; ZIMMERMANN (476): 2 new species of *Beneckia* from the Muschelkalk; WAGNER (451).

## 4. PRIMARY.

Palæozoic *Mollusca* of the Salt Range, India, 4 new species ; WAAGEN (449).—Fusulina Limestone of Valle del Fiume, 4 new genera, 1 n. subg., and 105 reputed new species ; GEMMELLARO (145).—Fossils of the Waverley beds, Ohio ; HERRICK (182).—Lower Coal measures : fossil fauna of Iowa ; KEYES, P. Ac. Philad. 1891, pp. 242–265.—Millstone Grit : *Pleuromutilus nodoso-carinatus*, Römer (Armstrong's *Nautilus nodiferus*) ; FOORD (128).—Carboniferous Limestone : *Leveillia*, nom. mut., for *Porcellia* (*L. latidorsata*, n. sp.) ; NEWTON (299).

Devonian : Molluscan fauna of S. England, 4 new genera, 35 new species ; WHIDBORNE (461) : Devonian of Manitoba, 2 new genera and 9 new species *Cephalopoda*, 2 new species *Gastropoda*, and 3 new species *Pelecypoda* ; WHITEAVES (463) : Devonian fossils of the Mackenzie River basin (Canada), 3 new species ; WHITEAVES (464) : Devonian *Aviculidae*, 1 n. g., 2 new subgenera, 52 new species, and 1 *Pecten* ; FRECH (135) : *Ditichia*, n. g. of *Nuculaceæ* ; SANDBERGER (378).

Silurian : *Ascoceratidae* and *Lituitidae* of the Upper Silurian of Gotland, 1 n. g., 15 new species ; LINDSTRÖM (232) : Paucispiral opercula of *Gastropoda* from the Guelph formation ; WHITEAVES (466) : 9 new species from the Upper Silurian of Victoria ; ETHERIDGE (107) : fauna of the Grès Armoricaïn of Brittany, 15 new species ; BARROIS (12) : Silurian of Saskatchewan, *Gomphoceras parvulum*, n. sp. ; WHITEAVES (465) : 1 new family, 1 n. g., 1 n. subg., and 6 new species of Silurian *Cephalopoda* ; SCHROEDER (388).

Cambrian : Cambrian of Sardinia ; BORNEMANN (33) : Upper Cambrian of the United States, with 11 new species ; WALCOTT (452).

## IV.—SYSTEMATIC.\*

*General.*

Aid to the study of the Tasmanian *Mollusca* ; JOHNSTON, P. R. Soc. Tasm. 1890, p. 57.

†List of figured specimens of fossil *Mollusca* in the York Museum ; Rep. Yorks. Phil. Soc. 1890, pp. 64–79.

## I. CEPHALOPODA.

*Cephalopoda* from Ceylon ; ORTMANN, Zool. Jahrb. v, Syst. pp. 669–678, figs.

†*Nautili* and *Ammonites*. Position of the last septum in the shell ; scars of shell muscles ; BUCKMAN, Q. J. Geol. Soc. xlvii (Proc.) p. 165.

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\* For convenience, the arrangement adopted in Fischer's Manual is here followed in the main. † is prefixed to fossil forms.

Catalogue of specimens in the Lisbon Museum ; GIRARD, J. Sci. Lisb. II, i, p. 233, and ii, p. 33.

Cleavage of the ovum ; WATASE, J. Morph. iv, pp. 247-302, figs.

Amœboid cells ; CATTANEO, Atti Soc. Ligust. i, p. 206, and Arch. Ital. Biol. xv, p. 409.

Displacement of pigment in the eye under the influence of darkness ; RAWITZ, Zool. Anz. 1891, p. 157.

Physiology of the retina ; *id. t. c.*

Development of the chromatophores in *Cephalopoda Octopoda* ; JOUBIN (205).

Nature of the movements of the chromatophores of *Cephalopoda* ; PHISALIX (328).

## DIBRANCHIATA.

### DECAPODA.

#### a. CHONDROPHORA.

##### ÆGOPSIDA.

*Calliteuthis alessandrini*, Vérany [as *Loligo*], anatomy ; APPELLÖF, Bergens Mus. Aarsber. 1889 (1890) No. 3, p. 27, fig. *C. reversa* recorded from the Mediterranean ; *t. c.* p. 31.

*Veranya sicula*, Krohn, anatomy ; APPELLÖF, Bergens Mus. Aarsber. 1889 (1890) No. 3, p. 7, fig.

*Ommatostrephide* : remarks on the relationship of the genera, which may be divided into two subfamilies, *Ommatostrephinos* and *Illicinis* ; POSSELT, Vid. Medd. 1890, p. 356.

*Todarodes sagittatus*, anatomy ; POSSELT, Vid. Medd. 1890, p. 301.

*Illex eblanæ*, Ball, note and description of a British specimen ; HOYLE, J. Mar. Biol. Ass. (n.s.) ii, p. 189.

† *Chaunoteuthis*, n. g., with *C. mollis*, n. sp. ; APPELLÖF, Bergens Mus. Aarsber. 1890, i, p. 3, fig. with anatomy.

† *Chtenopteryx*, n. g., with *C. fimbriatus*, n. sp., Mediterranean ; APPELLÖF, Bergens Mus. Aarsber. 1889 (1890) No. 3, p. 4, fig.

##### MYOPSIDA.

*Loligo pealei*, embryological study ; WATASE, J. Morph. iv, pp. 247-302, figs. *L. alessandrini*, Vérany, referred to *Calliteuthis* ; APPELLÖF, Bergens Mus. Aarsber. 1889 (1890) No. 3, p. 27, fig.

*L. singhalensis*, n. sp., Ceylon, ORTMANN, Zool. Jahrb. v, p. 676, fig.

*Sepia officinalis*, spermatogenesis ; PICTET, MT. z. Stat. Neap. x, pp. 123-129, fig.

*S. microcotyledon, framea*, Ceylon, ORTMANN, Zool. Jahrb. v, pp. 673 & 675, figs. ; † *S. bertii*, Lr. Pliocene of the Bolognese, FORESTI, Boll. Soc. geol. Ital. ix, p. 341, fig. : n. spp.

## b. PHRAGMOPHORA.

† *Belemnitidæ* are divided by PAVLOW into :—

1. *Notocoeli*.
2. *Bipartiti*.
3. *Dilatati*.
4. *Suprasulcati* (= *Canaliculati*, Neum.).
  - a. *Canaliculati*.
  - b. *Hastati*.
5. *Acuarii*.
6. *Infradepressi*.
  - a. *Porrecti*.
  - b. *Magnifici*.
  - c. *Explanati*.

Bull. Soc. Mosc. 1891, pp. 269–271.

† *Belemnites obeliscoides*, p. 222, *explanatoides*, p. 239, *breviaxis* [n. n. for *B. abbreviatus*, Miller], p. 247, *pistillirostris* [n. n. for *B. pistilliformis*, Blainv.], p. 260, *cristatus*, p. 261, *obtusirostris*, p. 262, *speetonensis*, p. 268, Speeton Clay, Yorks., PAVLOW, Bull. Soc. Mosc. 1891; † *B. rouillieri*, *mosymensis*, Jurassic of Russia, *id. t. c.* pp. 240 & 241 : n. spp.

## AMMONEA.

† *Aptychus* : true opercula of *Ammonites*; RETOWSKI, JB. Mineral, 1891, ii, p. 220, fig.

† *A. columbi*, n. sp., Cretaceous of Mexico, FELIX, Palæontogr. xxxvii, p. 188, fig.

## a. RETROSIPHONATA.

## GONIATITIDÆ.

† *Brancoceras pygmaeum*, n. sp., Fusulina Limest., Prov. of Palermo, GEMMELLARO, Giorn. Sci. Palerm. xx, p. 32, fig.

† *Gastrioceras waageni*, n. sp., Fusulina Limest., Prov. of Palermo, GEMMELLARO, *t. c.* p. 31, fig.

## b. PROSIPHONATA.

## ARCESTIDÆ.

† *Waagenoceras*, *Hyattoceros* (and subgen. *Abichia*), *Stacheoceras*, *Adrianites* (and subg. *Hoffmannia*), *Propinacoceras*, *Parapronorites*, *Sicanites*, *Daraclites*, *Thalassoceras*, *Paraceltites*, *Agathiceras*, *Doryceras*, and *Clinobolus*, n. gg., with many new species; GEMMELLARO, Giorn. Sci. Palerm. xix, 1888 (1888).

†*Adrianites isomorphus*, *craticulatus*, *affinis*, *haueri*, *burgensis*, n. spp., Fusulina Limest., Prov. of Palermo, GEMMELLARO, Giorn. Sci. Palerm. xx, pp. 20–25, figs.

†*Doryceras stouckenbergi*, n. sp., Fusulina Limest., Prov. of Palermo, GEMMELLARO, Giorn. Sci. Palerm. xx, p. 30, fig.

†*Paraceltites halli*, *munsteri*, *plicatus*, n. spp., Fusulina Limest., Prov. of Palermo, GEMMELLARO, Giorn. Sci. Palerm. xx, pp. 26–27, figs.

†*Stacheoceras gaudryi*, n. sp., Fusulina Limest., Prov. of Palermo, GEMMELLARO, Giorn. Sci. Palerm. xx, p. 15, fig.

†*Waagenoceras nikitini*, n. sp., Fusulina Limest., Prov. of Palermo, GEMMELLARO, Giorn. Sci. Palerm. xx, p. 10, fig.

#### CERATITIDÆ.

†*Beneckeia buchi*, *cognata*, n. spp., Muschelkalk, near Jena ; WAGNER, Z. geol. Ges. xliii, pp. 896–898, figs.

#### AMALTHEIDÆ.

†*Dorsetensia*, n. g. of *Amaltheidæ*, with *D. pulchra*, *complanata*, *subtecta*, *liostraca*, *tecta*, n. spp., with phylogeny, Inf. Oolite, British Is. ; BUCKMAN, Pal. Soc. pp. 302–312, figs.

†*Haplopleuroceras subspinatum*, *mundum*, n. spp., Inf. Oolite, British Is. ; BUCKMAN, Pal. Soc. pp. 300–302, figs.

†*Oxynoticeras leptodiscus*, n. sp., Lias of Portezuelo, Argent. Repub. ; BEHRENDSEN, Z. geol. Ges. xliii, p. 380, fig.

†*Sonniniæ*, n. subfam. of *Amaltheidæ* ; BUCKMAN, Pal. Soc. p. 287.

†Phylogenetic relationship of the species of *Amaltheidæ* of the Inf. Oolite ; BUCKMAN, Pal. Soc. p. 291.

†*Tissotia*, n. g. ; type, *Buchiceras tissoti*, Bayle ; DOUVILLÉ, Bull. Soc. Géol. xix, p. 499, fig.

†*Zurcheria parvispinata*, *inconstans*, n. spp., Inf. Oolite, British Is. ; BUCKMAN, Pal. Soc. pp. 296 & 297, figs.

#### AMMONITIDÆ.

†*Gigantic Ammonites* ; FRAAS, JH. Ver. Württ. xlvii, pp. 441 & 442. Remarks on some of Quenstedt's types of *Ammonites* ; KUGEL, JH. Ver. Württ. xlvii, p. 29, figs. †*Ammonites* from the Upper Cretaceous of France ; SEUNES, Mém. Soc. Géol. No. 2, i & ii. †*Ammonites* from the Neocomian of the Crimea ; KARAKASH (212).

†*Ammonites jurensis*, from the Northampton Sands ; NEWTON, Geol. Mag. 1891, p. 493.

†*A. julianyi*, Lower Cretaceous, Basses Alpes, BASTIDE, CR. Ass. Fr. Sci. 1890, ii, p. 367, figs. ; †*A. mirabilis*, *petitclerci*, *multiformis*, *devauxi*, Callovian of Western France, GROSSOUVRE, Bull. Soc. Géol. xix, pp. 258–261, figs. : n. spp.

†*Arietites subsalinarius*, *anastreptoptychus*, n. spp., Lower Lias of the N. E. Alps, WAEHNER, Beitr. Pal. Oesterr.-Ung. viii, pp. 241-243, figs.

## LYTOCERATIDÆ.

†*Rhacophyllites*: note on the peristome; STEFANI, Bull. Soc. Géol. xix, p. 231.

## HARPOCERATIDÆ.

†*Desmoceras angladei*, p. 173, *D. (?) cirtense*, p. 176, Barremien of Djebel-Ouach, SAYN, Ann. Soc. Agric. Lyon, iii, fig.; †*D. larteti*, Upper Cretaceous of France, SEUNES, Mém. Soc. Géol. No. 2, p. 19, fig.; †*D. planorbiforme*, Cretaceous of Upper Bavaria, BOEHM, Palæontogr. xxxviii, p. 49, fig.: n. spp.

†*Pachydiscus aturicus*, n. sp., Upper Cretaceous of France, SEUNES, Mém. Soc. Géol. No. 2, p. 17, fig.

†*Puzosia haugi*, n. sp., Upper Cretaceous of France, SEUNES, Mém. Soc. Géol. No. 2, p. 20, fig.

## STEPHANOCERATIDÆ.

†*Ancyloceras xelhuæ*, n. sp., Cretaceous of Mexico, FELIX, Palæontogr. xxxvii, p. 189, fig.

†*Baculites compressus*, Say: young shell originates in a spiral of 2-2½ turns; BROWN, P. Ac. Philad. 1891, p. 159, fig., and Naut. v, p. 19, fig.

†*B. valognensis*, n. sp., Cretaceous of Upper Bavaria, BOEHM, Palæontogr. xxxviii, p. 50, fig.

†*Cosmoceras lithuanicum*, *grewingkii*, n. spp., Popielan (Poland?), SIEMI-RADZKI, Pam. Akad. Krakau, xvii, pp. 60 & 63, figs.

†*Crioceras ? texanus*, n. sp., Cretaceous of Texas; HILL.

†*Holcodiscus algirus*, p. 188, *astieriformis*, p. 191, n. spp., Barremien of Djebel-Ouach, SAYN, Ann. Soc. Agric. Lyon, iii, fig.

†*Holcostephanus alcoyensis*, *douvillei*, n. spp., Cretaceous of Spain, NICKLÈS, Mém. Soc. Géol. i, pp. 18-20, figs.

†*Hoplites lamoricieri*, Barremien of Djebel-Ouach, SAYN, Ann. Soc. Agric. Lyon, iii, p. 197, fig.; †*H. mendozanus*, *protractus*, *calistoides*, Tithonian of Rodeviejo, Argentine Republic, BEHRENDSEN, Z. geol. Ges. xliii, pp. 399-402, figs.; †*H. otomilli*, *thachiensis*, *angulicostatus*, *tenochi*, *xipei*, *castilloi*, Cretaceous of Mexico, FELIX, Palæontogr. xxxvii, pp. 182-187, fig.: n. spp.

†*Olcostephanus zirkeli*, n. sp., Cretaceous of Mexico, FELIX, Palæontogr. xxxvii, p. 182, fig.

†*Perisphinctes kokeni*, n. sp., Tithonian of Rodesviejo, Argentine Republic, BEHRENDSEN, Z. geol. Ges. xliii, p. 406, fig.

†*Polymorphites senescens*, n. sp., Inf. Oolite, British Is., BUCKMAN, Pal. Soc. p. 268, fig.

†Phylogenetic relationships of the species of *Polymorphidae* of the Inf. Oolite; BUCKMAN, Pal. Soc. pp. 282 & 283.

†*Pulchellia* (*Stoliczkaia*?) *mariolæ*, *zeilleri*, *P. (Tissotia*?) *chalmasi*, Cretaceous of Spain, NICKLÈS, Mém. Soc. Géol. i, No. 4, pp. 11–16, figs.; †*P. changarnieri*, p. 155, *hoplitiformis*, p. 162, *danremonti*, p. 163, *subcaicedi*, p. 163, Barremien of Djebel-Ouach, SAYN, Ann. Soc. Agric. Lyon, figs. : n. spp.

†*Stephanoceras paucicostatus*, n. sp., Upper Jurassic of Mexico, FELIX, Palæontogr. xxxvii, p. 180, fig.

## TETRABRANCHIATA.

†The British Museum Catalogue of the Fossil *Cephalopoda*, Pt. II, *Nautiloidea* (continued), contains the families *Lituitidae*, *Trochoceratidae*, and *Nautilidae*. The fam. *Bactritidae*, included in this suborder in Pt. I, is now relegated to the *Ammonoidea*. The generic name *Cælonautilus* (proposed in 1880) is adopted in lieu of *Trematodiscus*, Meek & Worthen, preoccupied; FOORD (126).

## NAUTILIDÆ.

†*Actinoceras hindii*, n. sp., Devonian of Manitoba, WHITEAVES, Tr. R. Soc. Canada, viii, Sect. 4, p. 101, fig.

†*Cycloceras subarietiforme*, n. sp., Mid. Lias of Oestringen, FUTTERER, MT. Badischen geol. Landesanst. ii, p. 328, fig.

†*Cyrtoceras occidentale*, n. sp., Devonian of Manitoba, WHITEAVES, Tr. R. Soc. Canada, viii, Sect. 4, p. 103, fig.

†*Endolobus salomonensis*, n. sp., Fusulina Limest., Prov. of Palermo, GEMMELLARO, Giorn. Sci. Palermo, xx, p. 39, fig.

†*Estonioceras perforatum*, n. sp., Silurian (loc.?), SCHROEDER, Pal. Abh. (2) i, p. 30, fig.

†*Eurystomites*, n. g., type *Nautilus kelloggi*, Whitfield; SCHROEDER, Pal. Abh. (2) i, p. 26.

†*Gomphoceras manitobense*, Devonian of Manitoba, WHITEAVES, Tr. R. Soc. Canada, viii, Sect. 4, p. 102, fig.; †*G. parvulum*, Silurian of Saskatchewan, *id.* Canad. Rec. iv, p. 298, figs. : n. spp.

†*Gyroceras canadense*, *filicinctum*, *submamillatum*, Devonian of Manitoba, WHITEAVES, Tr. R. Soc. Canada, viii, Sect. 4, pp. 106 & 107, figs.; †*G. nodoso-costatum*, Fusulina Limest., Prov. of Palermo, GEMMELLARO, Giorn. Sci. Palermo, xx, p. 40, fig. : n. spp.

†*Homaloceras*, n. g., with *H. planatum*, n. sp., Devonian of Manitoba; WHITEAVES, Tr. R. Soc. Canada, viii, Sect. 4, p. 104, fig.

†*Lituitidae*: LINDSTRÖM, Sv. Ak. Handl. xxiii, No. 12, 1890: descrip-



tion of the shell, and tentative classification of the genera; REMELÉ (362).

†*Lituites hageni, decheni, heros, applunatus, danckelmanni*, n. spp., N. Germany, REMELÉ (362).

†*Nautilus neocomiensis* = *N. deslongchampsianus*; FOORD & CRICK, Geol. Mag. 1891, p. 22.

†*Ophidioceras rota*, n. sp., Upper Silurian of Gothland, LINDSTRÖM, Sv. Ak. Handl. xxiii, No. 12, 1890.

†*Orthoceras waageni, gradatum, ehleri, zonatum, burgense, siculum, lepton, elegantulum, hulli, adrianense, paternoi, subtriangulare, pillæ*, Fusulina Limest., Prov. of Palermo, GEMMELLARO, Giorn. Sci. Palerm. xx, pp. 41–50, figs.; †*O. (Thoracoceras) tyrrellii*, Devonian of Manitoba, WHITEAVES, Tr. R. Soc. Canada, viii, Sect. 4, p. 100, fig. : n. spp.

†*O. vaginatus*, Schloth., not identical with *Endoceras vaginatus*, Eichw., which last is a synonym for *E. zaddachi*, Schröder, FOORD, Geol. Mag., 1891, p. 355.

†*Orthoceras vaginatus*, Schloth., DAMES, JB. Mineral. 1891, i, p. 210.

†*Palæonautilus hospes*, n. sp., N. Germany, REMELÉ (362).

†*Planctoceras*, n. subg. of *Estonioceras*, type *P. falcatum*, Schloth.; SCHROEDER, Pal. Abh. (2) i, p. 41.

†*Pleuronautilus toulai*, n. sp., Fusulina Limest., Prov. of Palermo, GEMMELLARO, Giorn. Sci. Palerm. xx, p. 38, fig.

†*P. nodoso-carinatus*, Römer, redescribed and figured; Armstrong's *Nautilus nodiferus* is a synonym; FOORD, Geol. Mag. 1891, p. 481, fig.

†*Tetragonoceras*, n. g., with *T. gracile*, n. sp., Devonian of Manitoba; WHITEAVES, Tr. R. Soc. Canada, viii, Sect. 4, p. 105, fig.

†*Trematodiscus jugatonodosus*, Lr. Keuper of Thuringen, ZIMMERMANN, JB. k. preuss. geol. Landesanst. 1889 (1892), p. 322, 1 pl.; †*T. pleuro-nautiloides*, Fusulina Limest., Prov. of Palermo, GEMMELLARO, Giorn. Sci. Palerm. xx, p. 37, fig. : n. spp.

†*Trocholitidæ*, n. fam. proposed for the genera *Trocholites*, *Eurystomites* n. g., *Discoceras*, *Estonioceras*; SCHROEDER, Pal. Abh. (2) i, p. 5.

†*Trocholites orbis, macromphalus, soraviensis, contractus, damesii*, n. spp.; *T. remelei*, n. n. for *T. incongruus*, Angel.-Linstr., Silurian of German; SCHROEDER, Pal. Abh. (2) i, pp. 12–20, figs.

#### ASCOCERATIDÆ.

In this family LINDSTRÖM, Sv. Ak. Handl. xxiii, No. 12, 1890, includes the genera *Ascoceras*, *Glossoceras*, *Billingsites*, and *Choanoceras*, n. g.

†*Ascoceras* shell, with its richly ornamented surface was external.

†*Ascoceras cochleatum, dolium, fistula, pupa, reticulatum, manubrium, ampulla, collare, lagena, cucumis, decipiens, sipho, gradatum*, n. spp., Upper Silurian of Gotland, LINDSTRÖM, Sv. Ak. Handl. xxiii, No. 12, 1890.

†*Choanoceras*, n. g., with *C. mutabile*, n. sp., Upper Silurian of Gotland; LINDSTRÖM, Sv. Ak. Handl. xxiii, No. 12, 1890.

## II. PTEROPODA.

## CLIIDÆ.

*Olione limacina*, development ; KNIPOWITSCH, Biol. Centralbl. xi, p. 300, figs.

## CYMBULIIDÆ.

*Cymbulia peronii*, spermatogenesis ; PICTET, MT. z. Stat. Neap. x, pp. 75-152, fig.

*Cymbuliopsis calceola*, anatomy and histology ; PECK, Stud. Biol. Lab. J. Hopkins Univ. iv, p. 335, fig.

## HYOLITHIDÆ.

†*Hyolithis attenuatus*, *curvatus*, *H. ? corrugatus*, *H. newtoni*, n. spp., Cambrian of Nevada, WALCOTT, P. U. S. Nat. Mus. xxiii, pp. 269 & 270, figs.

†*Hyolithes kussakensis*, n. sp., Lower Palæozoic Salt Range, India, WAAGEN, Pal. Ind. iv, p. 101, fig.

## CONULARIIDÆ.

†*Conularia cambria*, Potsdam Sandst. of Wisconsin, WALCOTT, P. U. S. Nat. Mus. xiii, p. 270, fig. ; †*C. saliensis*, Devonian of the Mackenzie River Basin, WHITEAVES, Geol. Surv. Canada, Contribution to Canadian Palæont. i, p. 244, fig. ; †*C. warthi*, Upper Palæozoic, Salt Range, India, WAAGEN, Pal. Ind. iv, p. 126, fig. : n. spp.

## CAVEOLINIIDÆ.

†*Balantium flabelliforme*, *amplioroides*, n. spp., Cretaceous of Syria, BLANCKENHORN, (21) pp. 118 & 119, figs.

†*Vaginella labiata*, *rotundata*, n. spp., Cretaceous of Syria, BLANCKENHORN, (21) p. 119, figs.

†*Tentaculites cretaceus*, n. sp., Cretaceous of Syria, BLANCKENHORN, (21) p. 120, fig.

## III. GASTROPODA.

Comparative anatomy, with reference to classification, reviewed by VON JHERING, Bull. Sci. Fr. Belg. xxiii, pp. 151-236.

†Paucispiral opercula of *Gastropoda* in the Guelph formation, Ontario ; Canad. Rec. iv, p. 404.

## PULMONATA.

PILSBRY (339) proposes to primarily divide land Pulmonates into *Agnatha* and *Gnathophora*, instead of *Monotremata* and *Ditremata*, as done by Fischer.

Slugs of British Columbia ; COCKERELL, Naut. v, p. 30.

Relationship between the circulatory and nervous systems in Pulmonates ; BOUVIER, Bull. Soc. Z. Fr. xvi, p. 55.

Development of the central nervous system of Pulmonates ; SCHMIDT, SB. Ges. Dorp. ix, p. 277.

## STYLOMMATOPHORA.

## GEOPHILA.

*Agnatha*.

## TESTACELLIDÆ.

*Daudebardia saulcyi* and *rufa*, anatomy ; PLATE, Zool. Jahrb. iv, pp. 505-630, figs.

*Diplomphalus subantialba*, *huttoni*, *moussoni*, n. spp., New Zealand, SUTER, Tr. N. Z. Inst. xxii, pp. 226 & 227, figs.

*Ennea layardi*, and *anceyi* "(Nevill, MSS., 1882)" ! Old Calabar, ANCEY, Bull. Soc. Mal. Fr. vii, pp. 159 & 160 ; *E. (Huttonella) seatonii*, Tenasserim, BEDDOME, P. Z. S. 1891, p. 315, fig. ; *E. (Microstrophia) subcylindrica*, Perak, MOELLENDORFF, P. Z. S. 1891, p. 331, fig. : n. spp.

*Glandina cuneus*, *mazatlanica*, *excavata*, *lanceolata*, *fischeri*, *sulcifera*, n. spp., Mexico, MARTENS, Biol. Centr. Am. Mol. pp. 56-74, figs.

† *Oleacina neglecta*, n. sp., Tertiary of Bohemia, KLIKA, Arch. naturw. Landesforsch. Böhmen, vii, p. 21, fig.

† *Omphaloptyx bohémica*, n. sp., Tertiary of Bohemia, KLIKA, Arch. naturw. Landesforsch. Böhmen, vii, No. 4, p. 67, fig.

✓ *Orizosoma*, n. subg. of *Streptostyla* [q.v.].

*Rhytida lampra*, Pfr., anatomy ; HEDLEY, P. Linn. Soc. N.S.W. vi, p. 23, fig.

*R. globosa*, New Guinea, HEDLEY, Blue Book Report "H.M.'s Colonial Possessions, No. 103," p. 124 : reprint in Nature, xliii, p. 115 ; *R. meesoni*, South Is., N.Z., SUTER, Tr. N. Z. Inst. xxiii, p. 84, fig. : n. spp.

*Streptaxis (Odontartemon) heudei*, n. sp., Formosa, SCHMACKER & BËTTGER, Nachr. mal. Ges. 1891, p. 147, fig.

*Streptostele subangusta*, n. sp., Cameroons, MARTENS, SB. nat. Fr. 1891, p. 30.

*Streptostyla conulus*, Mexico, MARTENS, Biol. Centr. Am., Moll. p. 94, fig. : *S. (Orizosoma) tabiensis*, Yucatan, PILSBRY, Naut. v, p. 9 : n. spp.

*Testacellæ*, on some ; SIMROTH, J. Conch. vi, p. 423.

*Testacella* : anatomy of 5 spp. ; PLATE, Zool. Jahrb. iv, pp. 505-630, figs. : burrowing habits ; HORSMAN, Conchologist, 1891, p. 26 ; COLLINGE, t. c. p. 39.

### *Gnathophora.*

#### LIMACIDÆ.

*Agriolimax* : Irish species, with anatomy, &c. ; SCHARFF, Sci. Tr. R. Dublin Soc. iv, pp. 525-530, figs. *A. agrestis*, Linn. : synopsis of the principal varieties [or rather, variations] ; COCKERELL, Naut. v, p. 70. *Limax agrestis*, Linn., on the Pacific Coast ; TAYLOR, Naut. v, p. 92.

*A. andrios* [imperfectly described], p. 16, *bettgeri*, p. 14, *cerveni*, p. 17, Greece, SIMROTH, Abh. Senck. Ges. xvi, figs. ; *A. immaculatus*, Cintra, SIMROTH, N. Acta Ac. L.-C. Nat. cur. lvi, p. 286, fig. ; *A. caruanae*, Malta, POLLONERA, Boll. Mus. Zool. Anat. Comp. Torino, vi, p. 3 : n. spp.

*Amalia* : urinary apparatus ; PLATE, Zool. Jahrb. iv, Anat. pp. 580-586 : Irish species, with anatomy, &c. ; SCHARFF, Sci. Tr. R. Dublin Soc. iv, pp. 531-535, figs. *A. marginata* : synonymy [incomplete] ; COLLINGE, Conchologist, 1891, p. 9.

*A. cabiliana* n. sp., Algiers ; POLLONA, Boll. Mus. Zool. Anat. Comp. Torino, vi, No. 100, p. 4.

↓ *Arnouldia*, n. n. for *Conulus*, Fitz., the latter name having been used for an Echinoderm by Klein in 1734 ; BOURGUIGNAT, Bull. Soc. Mal. Fr. vii, p. 328.

*Conulus* : Fitzinger's name to be changed to *Arnouldia* ; the European forms described ; BOURGUIGNAT, Bull. Soc. Mal. Fr. iii, p. 328.

*Cystopelta petterdi*, Tate, anatomy ; HEDLEY, P. Linn. Soc. N.S.W. vi, p. 24, fig.

*Durgella hosei*, n. sp., Borneo, GODWIN-AUSTEN, P. Z. S. 1891, p. 40, fig.

*Euplecta minima*, n. sp., Moluccas, BETTGER, Ber. Senck. Ges. 1891, p. 255, fig.

↓ *Everettia*, n. subg. of *Macrochlamys* ; type, *Helix jucunda*, Pfeiff. ; GODWIN-AUSTEN, P. Z. S. 1891, p. 33, fig.

*Girasia affinis*, n. sp., Pegu, COCKERELL, Ann. N. H. vii, p. 106.

*Helicarioninae* : a classification ; COCKERELL, Ann. N. H. vii, p. 98.

*Helicarion robustus*, Gould : note on the ova ; HEDLEY, P. Linn. Soc. N.S.W. vi, p. 248. *H. verreauxi*, Pfr. : anatomy ; *id.* t. c. p. 24, fig.

*H. visi*, *musgravi*, Brit. New Guinea, HEDLEY, P. Linn. Soc. N.S.W. vi, pp. 76 & 77, fig. ; *H. duc*, Kouang-si, *comes*, Tchen-K'ou, *eques*, *miles*,

*pulex*, Ta-li fou [China], HEUDE, (477) p. 134, figs. ; *H. (?) whiteheadi*, Borneo, GODWIN-AUSTEN, P. Z. S. 1891, p. 24, fig.

*Hemiplecta formosa*, n. sp., Antananarivo (Madagascar), ANCEY, Bull. Soc. Mal. Fr. vii, p. 343.

*Hyalina* (not named), U. S., DALL, Naut. v, p. 10, fig. ; *H. microreticulata*, *allochroida*, New Zealand, SUTER, Tr. N. Z. Inst. xxii, pp. 227 & 228, fig. ; *H. (Vitrea) densegyrata*, *jetschini*, *maritæ*, *phitonia*, Transylvania, KIMAKOWICZ, Verh. Siebenb. Ver. xl, pp. 36-40 ; †*H. ihli*, *bohémica*, *vetusta*, Tertiary of Bohemia ; KLIKA, Arch. naturw. Landesforsch. Böhmen, vii, No. 4, pp. 29-31, figs. : n. spp.

*Ibycus siamensis*, n. sp., Siam ; COCKERELL, Ann. N. H. vii, p. 107.

*Kaliella indifferens*, n. sp., Moluccas ; BÆTTGER, Ber. Senck. Ges. 1891, p. 256, fig.

*Lamprocystis ambonica*, *subangulata*, Moluccas, BÆTTGER, Ber. Senck. Ges. 1891, pp. 257 & 259, figs. ; *L. malayana*, *conulina*, Perak, MOELLEN-DORFF, P. Z. S. 1891, p. 333, figs. ; *L. spadia*, Takao (Formosa), SCHMACKER & BÆTTGER, Nachr. mal. Ges. 1891, p. 151, fig. ; *L. subglobulus*, Siquijor Is. (Philippines), MOELLEN-DORFF, Nachr. mal. Ges. 1891, p. 40 : n. spp.

*Limax* : urinary apparatus ; PLATE, Zool. Jahrb. iv, Anat. pp. 580-586 : Irish species, with anatomy, &c. ; SCHARFF, Sci. Tr. R. Dublin Soc. iv, pp. 516-525, figs.

*L. (Heynemannia) græcus*, Greece, SIMROTH, Abh. Senck. Ges. xvi, p. 7, fig. ; *L. hemphilli*, Lr. California, BINNEY, Bull. Mus. C. Z. xix (1890), p. 205, fig. : n. spp.

*Macrochlamys dugasti*, Laos, MORLET, J. de Conch. xxxi, pp. 25 & 229, fig. ; *M. formosana*, par, Formosa, SCHMACKER & BÆTTGER, Nachr. mal. Ges. 1891, pp. 149 & 150, figs. ; *M. minuta*, Saleyer Is., MARTENS, (246) p. 231, fig. ; *M. peringundensis*, Peringunda Hill (India), BEDDOME, P. Z. S. 1891, p. 313, fig. ; *M. schmidtii*, Turcomania, BRANCSIK, Trencsén term. egy. xiii, p. 81, fig. ; *M. stearnsi*, n. sp., Kalgan, North China, PILSBRY, P. Ac. Philad. 1891, pp. 457 & 473, fig. : n. spp.

*Macroheyemannia*, n. sect. of *Heynemannia*, including *Limax taly-schunus*, *monticola*, *maximus*, *græcus*, and *conemenosi* ; SIMROTH, N. Acta Ac. L.-C. Nat. cur. lvi, p. 303, figs.

*Malacolimax (Melitolimax) melitensis*, Less. & Poll., re-characterized, genitalia and radula figured ; POLLONERA, Boll. Mus. Zool. Anat. Comp. Torino, vi, No. 99, pp. 2 & 3.

*Melitolimax*, n. subg., has the radula of *Malacolimax*, with reproductive apparatus similar to that of *Lehmannia* ; POLLONERA, Boll. Mus. Zool. Anat. Comp. Torino, vi, No. 99, p. 2.

*Microcystis dyakana*, Borneo, GODWIN-AUSTEN, P. Z. S. 1891, p. 37, fig. ; *M. turgida*, Maui Is. (Hawaii Arch.), ANCEY, Bull. Soc. Mal. Fr. vii, p. 339 : n. spp.

*Microcystina calcarata*, Brit. New Guinea, HEDLEY, P. Linn. Soc. N.S.W. vi, p. 76, fig. ; *M. st. johni*, *pudens*, *seclusa*, *cavernæ*, Borneo, GODWIN-AUSTEN, P. Z. S. 1891, pp. 38 & 39, figs. : n. spp.

↓ *Mikroheynemannia*, n. sect. of subg. *Heynemannia*, including *Limax cephalonicus*, *tenellus*, *subsaxanus*; SIMROTH, N. Acta Ac. L.-C. Nat. cur. lvi, p. 302, figs.

*Nanina floresiana*, vomer, Flores, MARTENS, (246) p. 230, figs.; *N. subcastor*, S. Travancore, BEDDOME, P. Z. S. 1891, p. 313, fig.: n. spp.

*Oxytes hercules*, *flyensis*, n. spp., Brit. New Guinea, HEADLEY, P. Linn. Soc. N.S.W. vi, pp. 70 & 71, figs.

*Parmella etheridgei*, Brazier: anatomy described; considers it a distinct genus of the *Helicarioninae*, allied to *Parmarion* and *Parmacochlea*, but more closely to *Cystopelta*; HEDLEY, Rec. Austral. Mus. i, p. 78, fig. *P. gracilis*, Gray: note by COCKERELL, Ann. N. H. viii, p. 331.

↓ *Pseudostenia*, n. subg. of *Ibycus*, type *Africarion ater*, Godwin-Aust.; COCKERELL, P. Z. S. 1891, p. 225.

*Sitala everetti*, *singularis*, *S. (?) orchis*, Borneo, GODWIN-AUSTIN, P. Z. S. 1891, pp. 39 & 40, figs.; *S. lineolata*, Siquijor Is. (Philippines), MOELLEN-DORFF, Nachr. mal. Ges. 1891, p. 39.

*Urocyclus pallescens*, n. sp., Natal, COCKERELL, Ann. N. H. vii, p. 101.

*Vitrina (Phenacolimax) bielzi*, n. sp., Hermannstadt, KIMAKOWICZ, Verh. Siebenb. Ver. xl, p. 25.

*Xesta strubelli*, n. sp., Moluccas, BËTTGER, Ber. Senck. Ges. 1891, p. 253, fig.

*Zonitidae*: genitalia and radula of some Bornean species; GODWIN-AUSTEN, P. Z. S. 1891, pp. 22-47, figs.

*Zonites shimckii*, Pils., figured; Naut. v, pl. ii.

*Z. cytheræ*, n. sp., Is. of Cerigo, MARTENS, SB. Nat. Fr. 1891, p. 148.

### PHILOMYCIDÆ.

*Tebennophorus*: critical notes on; PILSBRY, Ann. N. H. vii, p. 184: also correspondence with Cockerell, in Naut. iv [vide List of Papers].

### HELICIDÆ.

Monograph of the *Helicidæ* begun by Tryon is continued by PILSBRY, TRYON'S Manual (2nd ser.) vols. vi (1890) & vii.

↓ *Anadenulus*, n. g., type *Anadenus cockerelli*, Hemph.; COCKERELL, Ann. N. H. vi (1890) p. 278. [Imperfectly defined, in a table!]

*Arion*: urinary apparatus; PLATE, Zool. Jahrb. iv, Anat. pp. 580-586: Irish species, with anatomy, &c.; SCHARFF, Sci. Tr. R. Dublin Soc. iv, pp. 535-551, figs. *A. hortensis*, anatomy; RUTHERFORD (373). *A. hortensis*, *circumscriptus*, and their allies; COCKERELL, Conchologist, 1891, p. 33.

↓ *Arrudia*, n. subg. of *Geomalacus*; type, *G. anguiformis*, Morel.; POLLONERA, Boll. Mus. Zool. Torino, No. 87 (1890) p. 36.

† *Bulimus provensalis*, n. sp., Damien of Saint-Remy, NICOLAS, C.R. Ass. Fr. Sci. 1890, ii, p. 351, fig.

*Cochlostyla* :—

† *Chromatosphæra*, n. sect. of *Cochlostyla*; type, *C. aurata*, PILSBRY in TRYON'S Manual (2nd ser.), vii, p. 169.

† *Leytia*, new sect. of *Cochlostyla*; *C. fragilis*, Sow., the sole sp.; PILSBRY in TRYON'S Manual (2nd ser.) vii, p. 129.

† *Pachysphæra*, new subsect. of *Cochlostyla* (*Helicostyla*); type, *C. spherica*, Sow.; PILSBRY in TRYON'S Manual (2nd ser.) vii, p. 172.

† *Trachystyla*, new subsect. of *Cochlostyla* (*Calocochlea*); type, *C. cryptica*, Brod.; PILSBRY in TRYON'S Manual (2nd ser.) vii, pp. 130 & 166.

*Cochlostyla* (*Corasia*) *cœlaxis*, p. 114, *C. (Calocochlea) peraffinis*, p. 139, *C. xanthobasis*, p. 155, and *C. (Axina) striatissima*, p. 162, Philippines, PILSBRY in TRYON'S Manual (2nd ser.) vii, figs.; *C. papuensis*, Brit. New Guinea, HEDLEY, P. Linn. Soc. N.S.W. vi, p. 96, fig.; † *C. (Chloraea) lemuziana*, Tertiary of Bohemia, KLIKA, Arch. naturw. Landesforsch. Böhmen, vii, No. 4, p. 65, fig. : n. spp.

† *Dyakia*, n. g.; type, *Helix hugonis*, Pfeiff., with *D. intradentata*, *busanensis*, *molunensis*, n. spp., Borneo, GODWIN-AUSTEN, P. Z. S. 1891, pp. 29–33, figs.

*Geomalacus* and its anatomy; SCHARFF, Sci. Tr. R. Dublin Soc. iv, pp. 551–553, figs.

*G. oliveiræ*, n. sp., Guarda, SIMROTH, N. Acta Ac. L.-C. Nat. cur. lvi, p. 359, fig.

*Helix* :—

† *Austrochloritis*, n. subsect. (subg. *Chloritis*); type, *H. porteri*, Cox; PILSBRY in TRYON'S Manual (2nd ser.) vi (1890) p. 242.

† *Euhadra*, n. sec. (subg. *Camæna*); type, *H. peliomphala*, Pfr.; PILSBRY in TRYON'S Manual (2nd ser.) vi (1890) p. 94.

† *Macroön*, n. subg.: PILSBRY in TRYON'S Manual (2nd ser.) vi (1890), includes sections *Helicophanta*, *Panda*, *Acavus*, and *Stylodonta*.

† *Maoriana*, n. subg. (vice *Huttonella*, preoccupied by Enneu) proposed for a group of New Zealand *Helices* [*Helix pseudoleioda*, &c., q.v.]; SUTER, Tr. N. Z. Inst. xxiii, p. 95, and xxii, p. 224.

† *Neocepolis*, new sect. (subg. *Obba*); type, *H. merarcha*; PILSBRY in TRYON'S Manual (2nd ser.) vi (1890) p. 234.

† *Pacilostylus*, n. sect. (subg. *Ampelita*), comprising the 2 species *H. viridis*, Desh., and *cerina*, Morelet; PILSBRY in TRYON'S Manual (2nd ser.) vi (1890) p. 56.

† *Trichochloritis*, n. subsect. (subg. *Chloritis*); type, *H. breviseta*, Pfr.; PILSBRY in TRYON'S Manual (2nd ser.) vi (1890) p. 242.

*Camæna* and *Hadra*: Pilsbry's classification discussed; MOELLENDORFF, Nachr. mal. Ges. 1891, pp. 195–202.

## (PALÆARCTIC SPECIES.)

*Helix aspersa*: growth of the shell; VILLEPOIX (445). *H. elegans*, near Dover; Cox, Journ. Conch. vi, p. 377. *H. nemoralis* and *hortensis*,

notes on the banding; HORSLEY, Brit. Nat. 1891, pp. 16-18. *H. obvia* has priority over its synonym *H. candicans*; MARTENS, SB. nat. Fr. 1891, p. 34; also in Nachr. mal. Ges. 1891, p. 128. *H. personata* and its pretended American allies; PILSBRY, J. de Conch. xxxi, pp. 22 & 23. *H. quedenfeldti*, v. Martens; KOBELT, Nachr. mal. Ges. 1891, p. 140. *H.* species rare in France; GRANGER, Le Nat. 1891, p. 129. *H. pietruskyana*, Parr., *vicina*, Ross., *rossmüssleri*, Pfr., and var. *budayi*, *cingulella*, Zgl., genitalia figured; BRANCSIK, Math. term. köz. xxiv, pl. i.

*H. aspila* "(Bourg. in Sched. 1880)", *roigiana*, *montsiceana*, Catalonia, BOFILL, Bull. Soc. Mal. Fr. vii, pp. 268-275; *H. (Iberus ?) caltabellotensis*, p. 72, *H. (I.) verrucosa*, p. 73, Sicily, *H. zaccarensis*, p. 77, *calida*, p. 78, Algiers, *lampedusa*, p. 85, Lampedusa Is., *gattoi*, p. 86, Malta, *akrotirensis*, p. 87, Crete, KOBELT, in ROSSMAESSLER'S Iconographie, iv (1889-91), figs.; *H. (Trichia) blauii*, p. 6, Serajevo (Bosnia), *H. (Pomatia) valentini*, p. 27, Calymnos Is., KOBELT, in ROSSMAESSLER'S Iconographie, v, figs.; *H. (Campylæa) krueperi*, Greece, BETTGER, Nachr. mal. Ges. 1891, p. 84; *Campylæa (Eucampylæa) kiralikoeica*, Burzenland, Transylvania, KIMAKOWICZ, Verh. Siebenb. Ver. xl, p. 54; *Xerophila (Helicella) remota*, Transylvania, KIMAKOWICZ, Verh. Siebenb. Ver. xl, p. 77; *H. (Iberus) talanionica*, Monte Argentario, Tuscauy, KOBELT, Nachr. mal. Ges. 1891, p. 139 : n. spp.

[*Helix* :—] (PALÆOTROPICAL AFRICAN SPECIES.)

*Helix (Ampelita) cadaverosus*, Madagascar, proposed as n. sp. (p. 19), but afterwards held to be a depressed form of *H. sepulchralis*, Fér. (p. 301); PILSBRY in TRYON'S Manual (2nd ser.) vi (1890) figs.

*Helix (Dorcasia) namaquensis*, *porphyrostoma*, Namaqualand, *H. gypsina*, Springbok, MELVILL & PONSENBY, Ann. N. H. viii, pp. 237-239; *H. glauvilliana*, *aulacophora*, S. Africa, ANCEY, Bull. Soc. Mal. Fr. vii, pp. 157 & 158 : n. spp.

*Ampelita sikore*, n. sp., Antananarivo (Madagascar), ANCEY, Bull. Soc. Mal. Fr. vii, p. 344.

(PALÆOTROPICAL ORIENTAL SPECIES.)

*Helix colletii*, *shanica*, Shan States, BEDDOME, P. Z. S. 1891, p. 314, fig.; *H. (Hadra) pancala*, Formosa, SCHMACKER & BETTGER, Nachr. mal. Ges. 1891, p. 161, fig.; *H. longsonensis*, pp. 26 & 248, fig., *massiei*, pp. 26 & 247, fig., *H. (Chloritis) lemeslei*, p. 249, fig., Tonquin, MORLET, J. de Conch. xxxi; *H. (Aulacospira) aspritiæ*, p. 120, *H. (Trachia) malbatensis*, p. 132, Philippines, HIDALGO, Mem. Ac. Madrid, xiv : n. spp.

(AUSTRALIAN AND POLYNESIAN SPECIES.)

*Helix mandarina*, Gray, probably came from Bonin Is., and not Loo Choo; SMITH, Conchologist, 1891, p. 17.

*Hadra gulosa*, Gould, note on; HEDLEY, Rec. Austral. Mus. i, p. 196, fig.

*Helix (Ægista) pudica*, *grumulus*, (*Chloritis*) *meander*, *plena*, (*Geotrochus*)



*niahensis*, *tigaensis*, *subflava*, Borneo, GODWIN-AUSTEN, P. Z. S. 1891, pp. 43-45, figs.; *Obba tirmaniana*, Sangir Is., ANCEY, Bull. Soc. Mal. Fr. vii, p. 146; *H. (Rhagada) floresiana*, Flores, *H. (Eulotella) textoria*, Saleyer L., MARTENS (246) pp. 235 & 236, figs.; *H. (Dorcasia) suffodiens* [= *H. fodiens*, Wallace], Moluccas, BÖTTGER, Ber. Senck. Ges. 1891, p. 267, fig.; *H. (Planispira) chariessa*, Moluccas, PILSBRY in TRYON'S Manual (2nd ser.) vi (1890) p. 279, fig.; *Christigibba macgregori*, Brit. New Guinea (*C. corniculum*, Hombr. & Jacq., and *C. dentoni*, Ford [= *tuckeri*, Pfr.] have been recorded in error from this locality), HEDLEY, P. Linn. Soc. N.S.W. vi, p. 82, fig.; *H. bevani*, Brit. New Guinea, BAZIER in HEDLEY, P. Linn. Soc. N.S.W. vi, p. 85, fig.; *Geotrochus elisus*, p. 86, *trobriandensis*, p. 92, Brit. New Guinea, HEDLEY, P. Linn. Soc. N.S.W. vi, figs. (*G. (?) coniformis*, Fér., and *G. horderi*, Sow., have been recorded from this province in error, *id. ib.*); *H. (Papuina) hero*, *H. ianthe*, and *ærope*, New Guinea, SMITH, Ann. N. H. vii, pp. 451 & 452; *H. (Papuina) agnocheilus*, Brit. New Guinea, SMITH, P. Z. S. 1891, p. 488, fig.; *H. (Sphærospira) rohdei*, *lepidophora*, (*Chloritis*) *dephax*, New Guinea, KOBELT, Nachr. mal. Ges. 1891, pp. 203 & 204; *H. (Geotrochus) heimburgi*, New Britain, BRANCSIK, Trencsén term. egy. xiii, p. 80, fig.; *H. (Hadra) bourkensis*, Bourke, N. S. Wales, SMITH, Ann. N. H. vii, p. 137; *H. pseudoleioda*, *wairarapa*, *hectori*, *microundulata*, *aorangi*, New Zealand, form a group for which the name *Huttonella* is proposed, SUTER, Tr. N. Z. Inst. xxii, pp. 221-224, figs.; *Huttonella* (preoccupied for *Ennea*) changed to *Maoriana*, *id. op. cit.* xxiii, p. 95; *Amphidoxa (Calymna) feredayi*, North I., New Zealand, *id. t. c. p.* 91, fig.; *H. (Papuina) amphizona*, Solomon Is., PILSBRY in TRYON'S Manual (2nd ser.) vii, p. 5, fig. : n. spp.

*Anoglypta launcestonensis*, Reeve, anatomy; HEDLEY, P. Linn. Soc. N.S.W. vi, p. 22, fig.

[*Helix* :—] (NEOTROPICAL SPECIES.)

*Helix catenulata*, Cayenne, ANCEY, Bull. Soc. Mal. Fr. vii, p. 151; *H. (Plagiptycha) maynardi*, *H. (Hemitrochus) xanthophaes*, Bahamas, PILSBRY, P. Ac. Philad. 1891, p. 456 : n. spp.

(NEARCTIC SPECIES.)

*Helix personata* and its pretended American allies; PILSBRY, J. de Conch. xxxi, pp. 22 & 23; *H. (Polygyrella) harfordiana*, Cooper, refigured, and its systematic position defined; *id.* Naut. v, p. 40, pl. ii.

*Mesodon sayii*, Binn., near Canandaigua Lake; WALTON, P. Rochester Acad. i, p. 101, fig.

*Helix (Arionta) coloradoënsis*, Colorado, *magdalensis*, Mexico, n. spp., STEARNS, P. U. S. Nat. Mus. xiii, pp. 206 & 207, fig.

(FOSSIL SPECIES.)

† *Helix depereti*, p. 21, *mermieri*, p. 24, Quaternary of Baume d'Hostun (Drôme), LOCARD, Ann. Soc. L. Lyon xxxviii; † *H. (Macularia) renevieri*, 1891. [VOL. XXVIII.]

Tertiary of Switzerland, MAILLARD, Abh. Schw. pal. Ges. xviii, p. 43, fig.; †*H. (Acanthinula) trichoricensis, wärzenensis, rarissima*, (*Stenotrema*) *hirsutiformis*, (*Trichia*) *perfecta, manca*, (*Geotrochus*?) *papillifera*, Tertiary of Bohemia, KLIKA, Arch. naturw. Landesforsch. Böhmen, vii, No. 4, pp. 42-57, figs.; †*H. (Campylaea) standfesti*, Miocene of Reun, PENECKE, Z. geol. Ges. xliii, p. 360, fig.; †*H. cureti*, Danien of Saint-Remy, NICOLAS, C.R. Ass. Fr. Sci. 1890, ii, p. 359, fig. : n. spp.

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†*Ichnusarion*, n. subg. of *Arion*; type, *A. isselii*, Bourg.; POLLONERA, Boll. Mus. Zool. Torino, No. 87 (1890) p. 32.

*Patula* :—

*Patula* : a species closely resembling *P. fabrefacta*, Pease, found in Brit. New Guinea; HEDLEY, P. Linn. Soc. N.S.W. vi, p. 80.

*Helix (Patula) viridescens*, Pretoria, *hottentota*, Port Elizabeth, MELVILL & PONSONBY, Ann. N. H. viii, pp. 237-239; *Patula mutabilis, sterkiana, brouni, serpentinula, eremita*, South Is., New Zealand, SUTER, Tr. N. Z. Inst. xxiii, pp. 84-87, figs.; *P. colensoi, variegostata, rari-costata*, New Zealand, SUTER, t. c. pp. 225 & 226, figs.; *P. intonsa*, Mexico, PILSBRY, P. Ac. Philad. 1891, p. 314, fig.; †*P. (Anguispira) frūci, P. densestriata, alata*, Tertiary of Bohemia, KLIKA, Arch. naturw. Landesforsch. Böhmen, vii, No. 4, pp. 35 & 40, figs. : n. spp.

*Charopa texta*, n. sp., Brit. New Guinea, HEDLEY, P. Linn. Soc. N.S.W. vi, p. 79, fig.

*Macrocycloides microcyclis, saparuana, sericina*, n. spp., Moluccas, BÖTTGER, Ber. Senck. Ges. 1891, pp. 260 & 261, figs.

*Pitys cryptobidens*, n. sp., South Is., New Zealand, SUTER, Tr. N. Z. Inst. xxiii, p. 89, fig.

*Trochomorpha bintuanensis, quadrasi, crossei, bagoensis*, Philippines, HIDALGO, Mem. Ac. Madrid, xiv, pp. 116-118; *T. costulata*, Sumatra, MARTENS, (246) p. 232; *T. haenseli*, Formosa, SCHMACKER & BÖTTGER, Nachr. mal. Ges. 1891, p. 152, fig.; *T. staudingeri*, Sangir Is., ANCEY, Bull. Soc. Mal. Fr. vii, p. 145; *T. subnigritella*, Andaman Is., BEDDOME, P. Z. S. 1891, p. 314, fig.; *T. synoecia, granulosa*, Siquijor Is. (Philippines), MOELLENDORFF, Nachr. mal. Ges. 1891, pp. 42 & 43 [the *T. granulosa*, v. Möll. op. cit. 1888, p. 144, = *Helix metcalfei*] : n. spp.

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†*Phenacarion*, n. subg. of *Prophysaon*; type, *Arion foliatus*, Gould; COCKERELL, Naut. 1890, pp. 127 & 128.

*Phrixgnathus acanthinulopsis*, n. sp., South Is., New Zealand, SUTER, Tr. N. Z. Inst. xxiii, p. 92, fig.

*Prophysaon fasciatum*, United States, COCKERELL (in BINNEY), Bull. Mus. C. Z. xix (1890) p. 209, fig.; *P. pacificum, flavum, cœruleum, humile*, W. Coast N. America, COCKERELL, Naut. 1890, pp. 111 & 112 : n. spp.

*Psyra godeti*, n. sp., South Is., New Zealand, SUTER, Tr. N. Z. Inst. xxiii, p. 90, fig. : infested by *Distoma*, *id. t. c.* p. 95.

*Sculptaria chapmani*, n. sp., Damaraland, ANCEY, Bull. Soc. Mal. Fr. vii, p. 156.

## ORTHALICIDÆ.

*Porphyrobaphe galactostoma*, n. sp., Ecuador, ANCEY, Bull. Soc. Mal. Fr. vii, p. 153.

## BULIMULIDÆ.

*Amphidromus annæ*, Sayler Is., MARTENS, (246) p. 240, fig. ; † *A. gibbus*, Danien of Saint-Remy, NICOLAS, C.R. Ass. Fr. Sci. 1890, ii, p. 360, fig. ; *A. xiengensis*, Laos, MORLET, J. de Conch. xxxi, pp. 27 & 240, fig. : n. spp.

*Anteus pilsbryi*, n. sp., Brazil, FORD, P. Ac. Philad. 1891, p. 97, fig.

*Bulimulus alternatus*, varieties ; COCKERELL, J. de Conch. xxxi, pp. 23 & 24. *B. ragsdalei*, Pils., figured ; Naut. v, pl. ii.

† [*Bulimulus*] *Bulimus matheyi*, n. sp., Tertiary of Switzerland ; MAILLARD, Abh. Schw. pal. Ges. xviii, p. 74, fig.

*Partula occidentalis*, n. sp., Brit. New Guinea, HEDLEY, P. Linn. Soc. N.S.W. vi, p. 98, fig.

*Placostylus*, monograph by W. KOBELT in MARTINI & CHEMNITZ, i, Abth. 13. *Bulimus (Placostylus) bivaricosus*, Gaskoin, much thickened variety ; ETHERIDGE, Rec. Austral Mus. i, p. 131, figs.

*Placostylus guppyi*, calus, Solomon Is., SMITH, P. Z. S. 1891, p. 489, fig. ; *P. knoblauchii*, p. 15, *dupuyi*, p. 43, *rhinocheti*, p. 75, *pouenanus*, p. 92, *subeffusus*, p. 101, *smithii*, p. 105, *poynensis*, p. 107, *goulvainensis*, p. 109, *layardi*, p. 110, *neckliaiensis*, p. 116, New Caledonia, *paeteli*, p. 65, *pfeifferi* [= *Bulimus elobatus*, Pfr., non Gould], p. 130, Viti Is., *hartmanni*, p. 78, Aura Is. (New Hebrides), *mendanæ*, p. 133, Solomon Is., KOBELT in MARTINI & CHEMNITZ, i, Abth. 13, figs. ; (for *P. layardi*, *smithii*, see also KOBELT, Nachr. mal. Ges. 1891, pp. 28 & 29) : n. spp.

## CYLINDRELLIDÆ.

† *Distæctria*, n. n. for *Cylindrella*, Pfr. ; COSSMANN in HARRIS & BURROWS, (168) p. 114.

† *Spartina*, n. n. for *Thaumasia*, Albers, non Perty ; HARRIS & BURROWS, (168) p. 113.

## BULIMINIDÆ.

*Bulim[in]us dufresni*, Leach, and *B. tasmanicus*, anatomy ; HEDLEY, P. Linn. Soc. N.S.W. vi, pp. 19-22, figs.

*B. extorris*, Japan (?), BRANCSIK, Trencsén. term. egy. xiii, p. 81, fig. ;

*B. (Napæus) leptostracus*, *B. warburgi*, Formosa, SCHMACKER & BËTTGER, Nachr. mal. Ges. 1891, pp. 166 & 167, figs.; *B. (Rhachis) trichrous*, Ukwere (E. Africa), MARTENS, SB. nat. Fr. 1891, p. 16; *B. ferghanensis*, p. 45, Ferghana (Turkistan), *komarowi*, p. 48, Alai-Gebirg (Turkistan), *issericus*, p. 63, Palestro (Algiers), (*kabylianus* var. ?) *mansurensis*, p. 64, Beni-Mansur (Algiers), *blidahensis*, *thayacus*, *zengitanus*, *lambaesensis* (♀ vars. of *B. jeannotii*), pp. 65 & 66, Algiers and Tunis, *boghariensis*, p. 67, Boghar (Algiers), KOBELT in ROSSMAESSLER'S Iconographie, Bd. vi (1889-91), figs. : n. spp.

## PUPIDÆ.

*Balea viviparus*; CRAVEN & SMITH, Journ. Conch. vi, p. 421.

*Clausilia*: list of species near Prague; BLÁŽKA, Zool. Anz. 1891, p. 176. *C. saccata*, Küstr., and its allies; GREDLER, Nachr. mal. Ges. 1891, p. 58. *C. rugosa*, Drap.: some common deformities described by COCKERELL, P. Z. S. 1891, p. 145, figs.

*C. inchoata*, p. 33, Epirus, *freytagi*, p. 39, Samos, *artzeni*, p. 42, Kasos, *eumeces*, p. 47, Cyclades, *proteus*, p. 49, Sporades, *dorica*, p. 51, *almae*, p. 54, Doris, *chelidromia*, p. 55, *sporadica*, p. 58, N. Sporades, BËTTGER, Abh. Senck. Ges. xvi, figs.; *C. eumegetha*, *formosensis*, *odontochila*, *myersi*, *bagsana*, *uraniscopyx*, Formosa, SCHMACKER & BËTTGER, Nachr. mal. Ges. 1891, pp. 168-177, figs.; †*C. gobanzi*, *standfesti*, Miocene of Reun, PENECKE, Z. geol. Ges. xliii, pp. 366 & 367, figs.; †*C. (Canalicia?) filifera*, Tertiary of Bohemia, KLIKA, Arch. naturw. Landesforsch. Böhmen, vii, No. 4, p. 85, fig. : n. spp.

*Holospira semisculpta*, Mexico, *arizonensis*, Arizona, n. spp., STEARNS, P. U. S. Nat. Mus. xiii, p. 208, figs.

*Hypselostoma hungerfordianum*, n. sp., Perak, MOELLENDORFF, P. Z. S. 1891, p. 337, fig.

*Ovella jousseaumei*, n. sp. "(Bourguignat in litt.)" l, Aden, JOUSSEAUME, Bull. Soc. Mal. Fr. vii, p. 93, fig.

*Pupa muscorum*, Linn., PILSBRY, Naut. v, p. 45. *P. rupicola*, Say, and its allies; describes, but does not name, a new form; STERKI, op. cit. iv, p. 139. *P. syngenes*, Pils., figured; op. cit. v, pl. ii.

*P. freseriana*, *perlonga*, *phthisica*, *montsicciana*, Catalonia, BOFILL, Bull. Soc. Mal. Fr. vii, pp. 255-263; *P. mirabilis*, Oahu Is. (Hawaiian Archipelago), ANCEY, t. c. p. 339; †*P. (Coryna) diezi*, Miocene of Bohemia, FLACH, Verh. Ges. Würzb. xxiv (1890), No. 3, p. 1, fig.; †*P. (Coryna) præambula*, *P. pseudoennea*, Upper Miocene, Regensburg, FLACH, op. cit. pp. 2 & 3, figs. : n. spp.

†*Vertigo concinna*, p. 53 (name changed to *V. levenensis*, p. 141), SCOTT, Scot. Nat. 1891; *V. cubana*, Cuba, DALL, P. U. S. Nat. Mus. xiii, p. 1, fig.; *V. hermosa*, Massowah, JOUSSEAUME, Bull. Soc. Mal. Fr. vii, p. 86, fig.; *V. moluccana*, *saparuana*, Moluccas, BËTTGER, Ber. Senck. Ges. 1891, pp. 269 & 270, figs.; *V. thaumasta*, Port Elizabeth, MELVILL & PONSONBY, Ann. N. H. viii, p. 239 : n. spp.

## STENOGYRIDÆ.

† *Azeca boettgeri*, n. sp., Miocene of Reun, PENECKE, Z. geol. Ges. xliii, p. 364, fig.

*Cryptazeca monodonta*, description, with anatomy; FOLIN, Le Nat. 1891, pp. 264–267, figs.

*Limicolaria sculpturata*, n. sp., Mozambique, ANCEY, Bull. Soc. Mal. Fr. vii, p. 346.

† *Opeas* (?) *corrupta*, Tertiary of Bohemia, KLIKA, Arch. naturw. Landesforsch. Böhmen, vii, No. 4, p. 71, fig.; *O. ternatumum*, Moluccas, BETTGER, Ber. Senck. Ges. 1891, p. 273, fig. : n. spp.

*Zua thalassina*, n. sp., Massowah, JOUSSEAUME, Bull. Soc. Mal. Fr. vii, p. 88, fig.

## HELICTERIDÆ.

*Amastra heliciformis*, n. sp., Oahu Is. (Hawaii Archipelago), ANCEY, Bull. Soc. Mal. Fr. vii, p. 340.

*Helicter*: Hawaiian forms; LYONS, Hawaiian Annual, 1892 (1891).

*Tornatellina boeningi*, Formosa, SCHMACKER & BETTGER, Nachr. mal. Ges. 1891, p. 180, fig.; *T. extincta*, subfossil, Maui (Hawaiian Archipelago), ANCEY, Bull. Soc. Mal. Fr. vii, p. 341; *T. moluccana*, Moluccas, BETTGER, Ber. Senck. Ges. 1891, p. 274, fig. : n. spp.

## SUCCINEIDÆ.

*Succinea golehensis*, Ouellen, S. Algiers, FISCHER in DYBOWSKI, N. Arch. Miss. Scient. i, p. 362, fig.; † *S. rollieri*, Tertiary of Switzerland, MAILLARD, Abh. Schw. pal. Ges. xviii, p. 89, fig. : n. spp.

## ATHORACOPHORIDÆ.

† *Aneitella*, n. g.; type, *Athoracophorus virgatus*, Smith; COCKERELL, P. Z. S. 1891, p. 215.

*Athoracophorus marmoratus*, p. 71, *verrucosus*, p. 77, n. spp., Auckland Is., MARTENS in SIMROTH, N. Acta Ac. L.-C. Nat. cur. liv (1890), figs.

† *Neojanella*, n. g., with *N. dubia*, n. sp., Cook's Straits, COCKERELL, P. Z. S. 1891, p. 217.

† *Pseudaneitea*, n. subg. of *Athoracophorus*; type, *Janella papillata*; COCKERELL, P. Z. S. 1891, p. 217.

## VAGINULIDÆ.

† *Atopos*, n. g., with *A. semperi*, Mindanao, *leuckarti*, *strubelli*, n. spp., Amboina, p. 600; SIMROTH, Z. wiss. Zool. lii, pp. 593–616, figs.

† *Imerinia*, n. subg. of *Veronicella*; COCKERELL, P. Z. S. 1891, p. 219 [in a note: type not given].

↓ *Rathousia*, n. g., with *R. pantherina*, n. sp., Tchen-K'eu [China] ; HEUDE, (477) p. 133, fig.

*Vaginula carbonaria*, p. 132, *pictor*, p. 133, Tchen-K'eu [China], *patriatiana*, p. 133, Hong-Kong, *lemonieriana*, p. 133, China, HEUDE (477) figs.

*V. leydigi*, *hedleyi*, Queensland, and *V. hennigi*, Cambodia, n. spp., with figs. and description of their anatomy ; SIMROTH, Zool. Anz. v, pp. 862-864.

*Vaginulus schivelyæ*, Pils., figured ; Naut. v, pl. ii.

## BASOMMATOPHORA.

### GEHYDROPHILA.

#### AURICULIDÆ.

*Carychium*, American [= U. S.] forms ; PILSBRY, Naut. iv, p. 109.

*Cælostele bourguignati* and *stenostoma*, n. spp., Aden, JOUSSEAUME, Bull. Soc. Mal. Fr. vii, p. 95, figs.

↓ † *Dirhachis*, n. g., with *D. atavus*, n. sp., Devonian of S. England ; WHIDBORNE, Pal. Soc. p. 157, fig.

↓ *Micrelasma*, n. n. for *Anelasma*, Cossmann, *non* Darwin ; HARRIS & BURROWS, (168) p. 113.

### HYGROPHILA.

#### LIMNÆIDÆ.

† *Ancylus dogei*, Tertiary of Switzerland, MAILLARD, Abh. Schw. pal. Ges. xviii, p. 97, fig. ; † *A. subtilis*, Miocene of Reun, PENECKE, Z. geol. Ges. xliii, p. 357 : n. spp.

*Bulinus dybowskii*, n. sp., S. Algiers, FISCHER in DYBOWSKI, N. Arch. Miss. Scient. i, p. 365, figs.

*Limnæa* : notes on the sculpture of American species ; STEARNS, Naut. iv, p. 121. *L. peregra*, var. *ovaliformis* ; COCKERELL, Journ. Conch. vi, p. 380, and TAYLOR, *ibid.* *L. truncatula*, Müll. : notes by WALKER, Conchologist, 1891, p. 38.

*L. alfredi*, New Zealand, SUTER, Tr. N. Z. Inst. xxii, p. 229, fig. ; *L. crassilabrum*, River Adour, at Pey, FOLIN, Le Nat. 1891, p. 105, fig. ; † *L. cureti*, Rognacien of St. Remy, CAZIOT, Bull. Soc. Mal. Fr. vii, p. 139, fig. ; † *L. jaccardi*, *bertschingeri*, Tertiary of Switzerland, MAILLARD, Abh. Schw. pal. Ges. xviii, pp. 99 & 108, figs. ; *L. saharica*, Ouelles, S. Algiers, FISCHER in DYBOWSKI, N. Arch. Miss. Scient. i, p. 363, fig. : n. spp.

*Planorbis* : anatomy of species in Wurttemberg ; BUCHNER, JH. Ver. Württ. xlvii, p. 35, figs.

*P. anderssoni*, Omambond (Damaraland), ANCEY, Bull. Soc. Mal. Fr. vii, p. 161 ; † *P. blažkai*, Tertiary of Bohemia, KLIKA, Arch. naturw. Landesforsch. Böhmen, vii, No. 4, p. 110, fig. ; *P. salonensis*, Salon (Bouches-du-Rhône), FLORENCE, Bull. Soc. Mal. Fr. vii, p. 77 : n. spp.

## PHYSIDÆ.

†*Physa pygmaea, gracilis, patula, delecta*, n. spp., DANIEL of St. Remy, NICOLAS, C.R. Ass. Fr. Sci. 1890, ii, pp. 361 & 362, figs.

## THALASSOPHILA.

## SIPHONARIIDÆ.

√ *Parascutum*, n. n. for *Scutulum*, MONTEROSATO; COSSMANN, Ann. Géol. Univ. vi, p. 883, note.

## OPISTHOBRANCHIATA.

Relationship between the circulatory and nervous systems; BOUVIER, Bull. Soc. Z. Fr. xvi, p. 55.

## NUDIBRANCHIATA.

Monograph of the *Nudibranchiata Oladohepatica*, including the families *Æolidiadae*, *Tethymelibidae*, *Lomanotidae*, *Dotonidae*, *Dendronotidae*, *Bornelidae*, *Scyllacidae*, *Phylliroidae*, *Pleurophyllidiidae*, *Pleuroleuridae*, and *Tritoniidae*; BERGH, Zool. Jahrb. v, Syst. pp. 1-75.

Structure and function of the dorsal papillæ; HERDMAN, Rep. Brit. Ass. 1889 (1890) p. 630.

Innervation of epipodial processes; HERDMAN & CLUBB, Nature, xlv, p. 482.

Development of the liver; FISCHER, H., C.R. cxii, p. 1268.

## ANTHOBRANCHIATA.

## DORIDIDÆ.

Cryptobranchiate *Dorididae* monographically treated and divided into the subfamilies:—*Bathydorididae*, *Hexabranchidae*, *Archidorididae*, *Discodorididae*, *Diaululidae*, *Cadlinidae*, *Kentrodorididae*, *Platydorididae*, *Chromodorididae*, *Miamiridae*; BERGH, Zool. Jahrb. vi, Syst. pp. 103-144.

√ *Geitodoris*, n. g., with list of undefined species; BERGH, Zool. Jahrb. vi, Syst., p. 130.

## INFEROBRANCHIATA.

## HYPOBRANCHIÆIDÆ.

*Corambe testudinaria*: FISCHER, H., gives full description of this species, its anatomy and development, with figs.; he considers that *Corambe* should perhaps form the type of a group; Bull. Scient. Fr. Belg. xxiii, p. 358: also anatomy; *id.* C.R. cxii, p. 304.

## PLEUROPHYLLIDIIDÆ.

*Pleurophyllidia loveni*, Bergh, taken off the Eddystone; CUNNINGHAM, J. Mar. Biol. Ass. ii. p. 194.

## POLYBRANCHIATA.

## TETHYIDÆ.

*Tethys leporina*, anatomy and reproduction of the dorsal appendages; PARONA, Zool. Anz. xiv, p. 293.

## TRITONIIDÆ.

*Hancockia* : specimen taken at Plymouth ; GAMBLE, J. Mar. Biol. Ass. ii, pp. 193 & 194.

## ÆOLIDIDÆ.

† *Himatella*, n. g., with *H. trophina*, n. sp. (non def.), Pacific ; BERGH, Zool. Jahrb. v, Syst., p. 36.

## TECTIBRANCHIATA.

## ACTEONIDÆ.

† *Actæon blanckenhorni*, n. sp., Cretaceous of Upper Bavaria, BOEHM, Palæontogr. xxxviii, p. 55, fig.

† *Actæonella parva*, n. sp., Cretaceous of Syria, BLANCKENHORN, (21) p. 118.

† *Actæonina oviformis*, Cretaceous of Syria, BLANCKENHORN, (21) p. 117, fig. ; † *A. syriaca*, *marahhensis*, Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, pp. 435 & 436, figs. ; † *A. transatlantica*, *ovata*, Lias of Portezuelo, Argentine Republic, BEHRENDSEN, Z. geol. Ges. xliii, p. 383, figs. : n. spp.

† *Cylindritopsis*, n. g., with *C. ovalis*, *inflatus*, *minimus*, *cheilodontus*, *conicus*, n. spp., Fusulina Limestone, Province of Palermo ; GEMMELLARO, Giorn. Sci. Palermo, xx, pp. 53-56, figs.

† *Globiconcha* (*Tylostoma* ?) *gazellensis*, *altispira*, *G. ? triplica*, n. spp., Cretaceous of Syria ; WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, pp. 439 & 440, figs.

† *Liocarenus*, n. n. for *Fortisia*, Bayan, non Rondani ; HARRIS & BURROWS, (168) p. 113.

† *Tornatella abeihensis*, n. sp., Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 437, fig.

## TORNATINIDÆ.

† *Volvulella*, n. n. for *Volvula*, A. Adams, preoccupied ; NEWTON, (298) p. 268.



## SCAPHANDRIDÆ.

*Atys freyi*, n. sp., Nossi-Bé Is., BRANCSIK, Trencsén term. egy. xiii, p. 80, fig.

† *Bullinella*, n. n. for *Bullina*, Risso (*Cylichna*, Lovén), preoccupied; NEWTON, (298) p. 265.

*Cylichna grimaldii*, Senegal, DAUTZENBERG, Mém. Soc. Zool. iv, p. 26, fig.; *C. ordinaria*, Challenger Station 164 B, off Sydney, SMITH, P. Z. S. 1891, p. 442, fig. : n. spp.

## BULLIDÆ.

*Acera bullata*, Müll., genitalia; MAZZARELLI, Zool. Anz. xiv, pp. 241-243, fig. The author considers *Acera* should constitute a distinct family.

† *Akera siliciosa*, n. sp., Cretaceous of Syria; WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 441, fig.

*Bulla incommoda*, n. sp., Challenger Station 164 B, off Sydney, SMITH, P. Z. S. 1891, p. 442, fig.

## RINGICULIDÆ.

† *Ringicula nuda, celata*, n. spp., Cretaceous of Upper Bavaria, BOEHM, Palæontogr. xxxviii, p. 53, fig.

## PHILINIDÆ.

† *Philine (Megistostoma) patula*, n. sp., Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 434, fig.

## APLYSIIDÆ.

Morphology and physiology of the gland of Bohadsch; MAZZARELLI, Atti Acc. Napoli, iv, Append. No. 1: genitalia, *op. cit.* No. 5.

Anatomical notes; MAZZARELLI, Boll. Soc. Nat. Napoli, v, pp. 188-191.

*Aplysia lobiancoi*, n. sp., Posillipo, MAZZARELLI, Atti Acc. Napoli, iv, Append. No. 1, p. 22.

## PLEUROBRANCHIDÆ.

*Oscanius tuberculatus*, D. Ch., and *membranaceus*, Mtg., genitalia; MAZZARELLI, Zool. Anz. xiv, pp. 238-241, figs.

*Pleurobranchia meckelii*, Leue., genitalia; MAZZARELLI, Zool. Anz. xiv, pp. 233-238, figs.

*Pleurobranchus*: on the species in the Gulf of Naples; *P. stellatus*, Risso, redescribed; MAZZARELLI, Boll. Soc. Nat. Napoli, v, pp. 69-76, figs.

## PROSOBRANCHIATA.

Relationship between the circulatory and nervous systems in the *Prosobranchiata*; BOUVIER, Bull. Soc. Z. Fr. xvi, p. 54.

## PECTINIBRANCHIATA.

## TOXOGLOSSA.

## TEREBRIDÆ.

†Tertiary forms from Piedmont and Liguria, with tables of the phylogenetic relationships of the species; SACCO, Moll. ter. terz. Piemonte, x.

✧†*Fusoterebra*, n. subg. of *Terebra*, type *T. terebrina*, Bon. [for n. sp., under *Terebra*]; SACCO, Moll. ter. terz. Piemonte, x, p. 59.

✧†*Spineoterebra*, n. subg. of *Terebra*, type *T. cossentini*, Phil., var. *spinulosa*, Dod.; SACCO, Moll. ter. terz. Piemonte, x, p. 58.

✧†*Strioterebrum*, n. subg. of *Terebra*, type *T. basteroti*, Nyst. [for n. sp., see under *Terebra*]; SACCO, Moll. ter. terz. Piemonte, x, p. 33.

†*Terebra* (*Subula*) *conicoplicaria*, (*Terebrum*) *simplicodepressum*, *taurostrangulatum*, *subulocacellense*, *subulatoideum*, *postneglectum*, (*Strioterebrum*) *exbistriatum*, *atorquatum*, (*Hastula*) *dertolanceolata*, (*Fusoterebra*?) *proteterebrina*, Tertiary of Piedmont, SACCO, Moll. ter. terz. Piemonte, x, pp. 15-61, figs.; *T. stearnsii*, Japan, PILSBRY, P. Ac. Philad. 1891, p. 472, fig. : n. spp.

## CONIDÆ.

✧*Asthenotoma*, n. n. for *Oligotoma*, Bellardi, non Westwood; HARRIS & BURROWS, (168) p. 113.

✧*Bathytoma*, n. n. for *Dolichotoma*, Bellardi, non Hope; HARRIS & BURROWS, (168) p. 113.

✧*Bela guernei*, n. sp., Gulf of Gascogne, DAUTZENBERG, Mém. Soc. Zool. iv, p. 614, fig.

*Clathurella bourguignati, servaini*, English Channel and French Atlantic Coast, *decorata*, Mediterranean, LOCARD, Ann. Soc. Linn. Lyon, xxxvii, pp. 64-67.

†*Clavatula*: a number of new forms from the Miocene of Austro-Hungary; HOERNES, Verh. geol. Reichsanst. 1891, pp. 125-133.

†*Clinura*: occurrence in the Miocene of Austro-Hungary; HOERNES, Verh. geol. Reichsanst. 1891, p. 218.

*Columbarium distephanotis*, n. sp., Torres Straits, MELVILL, Journ. Conch. vi, p. 405, fig.

†*Conus basteroti, benoisti, cazioti, clanculus, falloti, gallicus, granulocinctus, larraldei, peregrinus, præcursor, saucatsensis, vasseuri*, Neogene, MAYER-EYMAR, Viert. Ges. Zurich. xxxv, pp. 293-297, also J. de Conch. xxxi, pp. 323-335, figs.; *C. adenensis*, Aden, SMITH, P. Z. S. 1891, p. 401,

fig. ; *C. innotabilis*, New S. Wales, *id. t. c.* p. 487, fig. ; *C. jousseaumei*, Is. of Oma (Moluccas), COUTURIER, J. de Conch. xxxi, p. 212, fig. ; *C. segravei*, Victoria, GATLIFF, Vict. Nat. vii, p. 179, fig. ; *C. (Chelyconus) worcesteri*, Mauritius, BRAZIER, P. Linn. Soc. N.S.W. vi, p. 276, fig. : n. spp.

†*Dolichotoma* occurring in the Miocene of Austro-Hungary ; HOERNES, Verh. geol. Reichsanst. 1891, pp. 268–271.

*Hædropleura forbesi*, *hanleyi*, Eng. Channel, LOCARD, Ann. Soc. L. Lyon, xxxvii, p. 54 ; †*H. delheidi*, Pliocene of Antwerp, VINCENT, Bull. Soc. Mal. Belg. 1890, p. xcvi, fig. : n. spp.

†*Mangilia* ? *solitaria*, Cretaceous of Syria ; WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 415, fig. ; †*Mangilia* (*Bellardiella*) *consobrina*, Neogene, MAYER-EYMAR, Viert. Ges. Zürich. xxxv, p. 292 ; also J. de Conch. xxxi, p. 322, fig. : n. spp.

*Mitromorpha brazieri*, n. sp., Port Jackson ; SMITH, P. Z. S. 1891, p. 487, fig.

*Oligotoma sirpata*, n. sp., Aden, JOUSSEAUME, Le Nat. 1891, p. 231.

†*Oligotoma* occurring in the Miocene of Austro-Hungary ; HOERNES, Verh. geol. Reichsanst. 1891, pp. 268–271.

*Peratotoma*, n. n. for *Homotoma*, Bellardi, non Guérin-Ménéville ; HARRIS & BURROWS, (168) p. 113.

↓*Phlyctis*, n. n. for *Phlyctænia*, Cossmann, non Hübner ; HARRIS & BURROWS, (168) p. 113.

†*Pleurotomidæ*: Miocene forms from Austro-Hungary, with classification ; HOERNES & AUINGER, Die Gasteropoden, &c., pp. 283–382.

*Pleurotoma hirondeleæ*, Gulf of Gascogne, DAUTZENBERG, Mém Soc. Zool. iv, p. 613, fig. ; *P. symbiotes*, Laccadive Sea, WOOD-MASON & ALCOCK, Ann. N. H. viii, p. 444, fig. ; *P. (Drillia) baynhami*, Aden, SMITH, P. Z. S. 1891, p. 404, fig. : n. spp.

†*P. antverpiensis*, Pliocene of Antwerp, VINCENT, Bull. Soc. Mal. Belg. 1890, p. xcvi, fig. ; †*P. buffoni*, *torcapeli*, *austro-gallica*, *evoluta*, Neogene, MAYER-EYMAR, Viert. Ges. Zürich, xxxv, pp. 290–292, also J. de Conch. xxxi, pp. 317–321, figs. ; *P. schäferi*, Cretaceous of Upper Bavaria, BOEHM, Palæontogr. xxxviii, p. 56, fig. ; †*P. carolinæ*, *antonix*, *mathildæ*, *irenæ*, *eugenix*, (*Surcula*) *emiliæ*, *lauræ*, (*Genota*) *stephanix*, *valerix*, (*Drillia*) *victorix*, *angustæ*, *helenæ*, *adelæ*, *herminæ*, (*Clavatula*) *reginæ*, *dorotheæ*, *brigittæ*, *olgæ*, *natalix*, *sidonix*, *camillæ*, *claræ*, *evæ*, *antonix*, *amaliæ*, *susannæ*, *juliæ*, *veronicæ*, *agathæ*, *apollo-nix*, *angelæ*, *barbarix*, *sabinæ*, *ursulæ*, *olivix*, *justinæ*, *lydiæ*, (*Pseudotoma*) *lucix*, *floræ*, *giselæ*, *malvinæ*, *idæ*, (*Ronaultia*) *magdalenæ*, n. spp. *P. annæ* [= *turricula*, Hoernes, non Brocc.], *P. (Surcula) berthæ* [= *rotulata*, Hoernes, non Bon.], *P. (Genota) elisæ* [= *ramosa*, Hoernes, non Bast.], *P. (Drillia) josephinæ* [= *gradata*, Hoernes, non DeFr.], *P. (Clavatula) sophix* [= *interrupta*, Hoernes, non Brocc.], *P. (Clav.) mariæ* [= *concatenata*, Hoernes, non Grat.], *P. (Clav.) rosaliæ* [= *asperulata*, Hoernes, p.p.], *P. (Clav.) eleonoræ* [= *asperulata*, Hoernes, p.p.], *P. (Clav.) louisæ* [= *calcarata*, Hoernes, non Grat.], *P. (Clav.)*

*emma* [= *pretiosa*, Hoernes, non Bell.], *P. (Pseudotoma) theresiae* [= *intorta*, Hoernes], *P. (Rouaultia) marthae* [= *spiralis*, Hoernes, non Serr.], n. n., Miocene of Austro-Hungary, HOERNES & AUINGER, Die Gasteropoden, &c., pp. 292-382, figs.

*Drillia cecchii*, Adon, JOUSSEAUME, Le Nat. 1891, p. 232; *Pleurotoma (Drillia) challengeri, crossei, hoylei, watsoni*, Challenger Station 164 B, off Sydney, SMITH, P. Z. S. 1891, pp. 438 & 439, figs. : n. spp.

† *Pseudotoma*: occurrence in the Miocene of Austro-Hungary; HOERNES, Verh. geol. Reichsanst. 1891, p. 241.

† *Pusionella*: Tertiary forms of *Pusionellidae* from Piedmont and Liguria, with tables of the phylogenetic relationships of the species; SACCO, Moll. ter. terz. Piemonte, x.

† *P. pedemontana, tauronifat*, n. spp., Tertiary of Piedmont, SACCO, Moll. ter. terz. Piemonte, x, p. 62, figs.

*Raphitoma decussatum, reconditum*, French Atlantic Coast, *zonatum*, Mediterranean; LOGARD, Ann. Soc. L. Lyon, xxxvii, pp. 58 & 59.

† *Rouaultia* occurring in the Miocene of Austro-Hungary; HOERNES, Verh. geol. Reichsanst. 1891, pp. 268-271.

#### CANCELLARIIDÆ.

*Cancellaria crawfordiana*, Drake's Bay, San Francisco, DALL, P. U. S. Nat. Mus. xiv, p. 182, fig.; *C. exigua*, Challenger Station 164 B, off Sydney, SMITH, P. Z. S. 1891, p. 439, fig.; † *C. (Trigonostoma) hidasensis, (Narona) dregeri, bicarinata*, Miocene of Austro-Hungary, HOERNES & AUINGER, Die Gasteropoden, &c., pp. 276-280, figs. : n. spp.

#### RACHIGLOSSA.

##### OLIVIDÆ.

*Oliva cryptospira*, n. sp., Moluccas; FORD, P. Ac. Philad. 1891, p. 97, fig.

*O. semmelinki*, Schepm. (1890) fig.; Notes Leyd. Mus. xiii, pl. ix.

† *Olivella chili*, n. sp., Tertiary of Grand Canary, ROTHPLETZ & SIMONELLI, Z. geol. Ges. xiii, p. 720, fig.

##### MARGINELLIDÆ.

† *Marginella angustiforis*, Tertiary of Grand Canary, ROTHPLETZ & SIMONELLI, Z. geol. Ges. xlii, p. 718, fig.; *M. brazieri, carinata*, Challenger Station 164 B, off Sydney, SMITH, P. Z. S. 1891, p. 440, figs. : n. spp.

##### VOLUTIDÆ.

*Scaphella (Voluta) arnheimi*, n. sp., California; RIVERS, P. Cal. Ac. Sci. iii, p. 107.

† *Volutilithes angustata*, *fusiformis*, *spicata*, *pusilla*, *subcorrugata*, n. spp., Cretaceous of Upper Bavaria, BOEHM, Palæontogr. xxxviii, pp. 56 & 57, figs.

† *Volutomorpha ? orientalis*, n. sp., Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 414, fig.

## MITRIDÆ.

† *Mitra basteroti*, *cochlearella*, *facilis*, *multistriata*, *paulensis*, *prænigra*, *sallomacensis*, Neogene, MAYER-EYMAR, Viert. Ges. Zürich, xxxv, pp. 298-301, also J. de Conch. xxxi, pp. 335-343, figs.; † *M. borzolensis*, Lower Pliocene of Borzoli, CAMPANA, Atti Soc. Ligust. i, p. 150, fig.; *M. bourguignati*, *subpyramidella*, *plicatuliformis*, Mediterranean, LOCARD, Ann. Soc. L. Lyon, xxxvii, pp. 48 & 49; † *M. da-costai*, Tertiary of Grand Canary, ROTHPLETZ & SIMONELLI, Z. geol. Ges. xlii, p. 719, fig.; *M. miranda*, Challenger Station 164 B, off Sydney, SMITH, P. Z. S. 1891, p. 440, fig; *M. (P Costellaria) nodocancellata*, Gulf of California, STEARNS, P. U. S. Nat. Mus. xiii, p. 213, fig. : n. spp.

## FASCIOLARIIDÆ.

† *Fasciolaria pleurotomoides*, *pyrulaeformis*, *moravica*, n. spp., Miocene of Austro-Hungary, HOERNES & AUINGER, Die Gasteropoden, &c., pp. 265 & 266, figs.

† *Fusus bhamdunensis*, Cretaceous of Syria, BLANCKENHORN, (21) p. 117, fig; *F. rissoianus*, Mediterranean, LOCARD, Ann. Soc. L. Lyon, xxxvii, p. 106; *F. sieboldi*, Japan, SCHEPMAN, Notes Leyd. Mus. xiii, p. 62, fig.; † *F. senonensis*, *F. ? subcancellatus*, Cretaceous of Bavaria, BOEHM, Palæontogr. xxxviii, pp. 59 & 60, figs. : n. spp.

† *F. (Euthria) subnodosus*, *F. (Genea) transsylvanicus*, *F. grundensis*, n. spp., *F. austriacus* [= *rostratus*, Hoernes, non Olivi], *F. crispoides* [= *crispus*, Hoernes, non Borson], *F. vindobonensis* [= *semirugosus*, Hoernes, non Bell. & Micheti.], n. n., Miocene of Austro-Hungary, HOERNES & AUINGER, Die Gasteropoden, &c., pp. 258-261, figs.

*Latirofusus nigrofuscus*, n. sp., Australia, TATE, Tr. R. Soc. S. Austral. xiv, p. 258, fig.

*Latirus*: historical account of the genus, and list of the species; MELVILL, Mem. Manch. Soc. iv, p. 365, figs.

*L. eppi*, Curaçoa, MELVILL, t. c. p. 394, and Notes Leyd. Mus. xiii, p. 158; *formosior*, hab. ? , id. Mem. Manch. Soc. iv, p. 394; † *L. indifferens*, Cretaceous of Bavaria, BOEHM, Palæontogr. xxxviii, p. 59, fig.; † *L. termitanus*, Oligocene of Sicily, CIOFALO, Atti Acc. Gioen. ii, p. 92, fig.; † *Turbinella (Latirus) fusiformis*, *T. (Leucozonia) cossmanni*, *T. badensis*, *columbelloides*, Miocene of Austro-Hungary, HOERNES & AUINGER, Die Gasteropoden, &c., pp. 269 & 270, figs. : n. spp.

*Peristernia mannophora*, Madagascar, *hilaris*, *canthariformis*, *cremnochione*, *smithiana*, *retiaria*, Mauritius, *leucothea*, Port Natal, *selina*, Sand-

wich Is., *iniuensis*, Iniue (or Savage) Is., MELVILL, Mem. Manch. Soc. iv, pp. 395-400, figs. ; † *P. atlantica*, Tertiary, Grand Canary, ROTHPLETZ & SIMONELLI, Z. geol. Ges. xlii, p. 717, fig. : n. spp.

## TURBINELLIDÆ.

† *Caricella planilirata*, n. sp., Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 414, fig.

## BUCCINIDÆ.

! *Andonia*, n. n. for *Genea*, Bellardi, non Rondani ; HARRIS & BURROWS, (168) p. 112.

*Buccinum strigillatum*, Guadelupe Is., Lower California, *taphrium*, Akutan Is., Alaska, n. spp., DALL, P. U. S. Nat. Mus. xiv, p. 186.

*B. undatum*, L., egg-capsules ; MÖBIUS, SB. nat. Fr. 1891, p. 146.

*Chrysodomus ithius*, off coast of California, *periscelidus*, Alaska, *phæniceus*, British Columbia, (*Sipho*) *hypolispus*, *acosmius*, and *halibrectus*, Behring Sea, n. spp., DALL, P. U. S. Nat. Mus. xiv, pp. 187 & 188.

*Engina harveyana*, n. sp., W. coast of Africa, BAKER, P. Ac. Philad. 1891, p. 61.

*Euthria* : descriptions of the French species, with *E. major*, n. sp. [?] ; LOCARD, Bull. Soc. Mal. Fr. vii, p. 187-218.

*Mohnia frielei*, n. sp., off coast of British Columbia ; DALL, P. U. S. Nat. Mus. xiv, p. 186.

*Pisania gaskelli*, n. sp., hab. ? , MELVILL, J. de Conch. vi, p. 406, fig.

† *Pollia bellardii*, *moravica*, *ranellaformis*, *lapugyensis*, *weinsteigensis*, *maria*, *subpusilla*, n. spp., *badensis*, n. n. [for *P. budai*, Hoernes, non Michiti], Miocene of Austro-Hungary ; HOERNES & AUINGER, Die Gastropoden, &c, pp. 237-242, figs.

*Siphonalia oligostira*, n. sp., Australia, TATE, Tr. R. Soc. S. Austr. xiv, p. 258, fig.

*Strombella middendorffi*, Alaska, *fragilis*, *melonis*, Behring Sea, n. spp., DALL, P. U. S. Nat. Mus. xiv, pp. 186 & 187.

*Tritonidea undulata*, n. sp., Japan, SCHEPMAN, Notes Leyd. Mus. xiii, p. 155, fig.

## NASSIDÆ.

*Amycla inflata*, n. sp., Mediterranean, LOCARD, Ann. Soc. L. Lyon, xxxvii, p. 84.

*Demoulia* [usually misspelt *Desmoulea*], 7 species enumerated from Africa ; SMITH, Ann. N. H. viii, p. 320.

*Nassa californiana*, CONR., in the living state ; RIVERS, Zoe, ii, p. 70, fig. On the confounding of *N. trivittata*, Say, and † *N. peralta* (Con. sp.) ; HARRIS, Am. Geol. viii, p. 174.

† *Nassa bellardi*, Lower Pliocene of Borzoli, CAMPANA, Atti Soc.

Ligust. i, p. 147, fig. ; *N. (Alectryon) freyi*, Nossi-Bé Is., BRANCSIK, Trencsén term. egy. xiii, p. 80, fig. ; *N. javana*, S. Java, SCHEPMAN, Notes Leyd. Mus. xiii, p. 156, fig. : n. spp.

*Spheronassa irregularis*, n. sp., Mediterranean, LOCARD, Ann. Soc. L. Lyon, xxxvii, p. 74.

## COLUMBELLIDÆ.

*Columbella propinqua*, n. sp., Aden, SMITH, P. Z. S. 1891, p. 405, fig.

## MURICIDÆ.

Remarks ; BAKER, P. Ac. Philad. 1891, p. 56. Catalogue and synonymy of recent species ; *id.* P. Rochester Acad. i, p. 153.

*Donovania lefebvrei*, *bourguignati*, n. spp., Mediterranean, LOCARD, Ann. Soc. L. Lyon, xxxvii, p. 72, fig.

*Murex*: remarks on the apices of certain forms ; BAKER, P. Rochester Acad. i, p. 129, figs. *M. fortispina* opens the valves of *Arca* by means of a tooth-like process on the outer lip ; FRANÇOIS, Arch. Z. expér. ix, pp. 240-242, fig.

*M. (Chicoreus) bituberculatus*, n. sp., Australia, BAKER, P. Rochester Acad. i, p. 133, fig.

*Ocenebra wardiana*, Australia, *rubra*, hab. ?, n. spp., BAKER, P. Rochester Acad. i, p. 134, figs.

*Purpura (Thalessa) problematica*, n. sp., Japan, BAKER, P. Rochester Acad. i, p. 135, fig.

*Ricimula (Sistrum) rugosoplicata*, n. sp., Lr. California, BAKER, P. Ac. Philad. 1891, p. 58.

*Trophon cerrosensis*, Cerros Is., Lr. California, DALL, P. U. S. Nat. Mus. xiv, p. 181, fig. ; *T. (Boreotrophon) scitulus*, Behring Sea, *disparilis*, Gray's Harb., Washington, DALL, P. U. S. Nat. Mus. xiv, p. 189 : n. spp.

*Trophonopsis curta*, n. sp., Mediterranean, LOCARD, Ann. Soc. L. Lyon, xxxvii, p. 109.

*Urosalpinx cinerea*, embryology ; CONKLIN, Johns Hopk. Univ. Circ. x, p. 90.

## TÆNIOGLOSSA.

## TRITONIDÆ.

*Lampusia (Priene) murrayi*, n. sp., Cape, SMITH, P. Z. S. 1891, p. 436, fig.

## CASSIDIDÆ.

†Tertiary forms from Piedmont and Liguria, with tables of the phylogenetic relationships of the species ; SACCO, Moll. ter. terz. Piemonte, x.

†*Galeodea proechinophora*, *tuberculatissima*, n. spp., Tertiary of Piedmont, SACCO, Moll. ter. terz. Piemonte, x, pp. 3 & 4, figs.

## DOLIIDÆ.

†Tertiary forms of *Galeodoliidæ*, *Doliidæ*, and *Ficulidæ* from Piedmont and Liguria, with tables of the phylogenetic relationships of the species ; SACCO, Moll. ter. terz. Piemonte, viii.

†*Eudolium subfasciatum*, *antiquum*, n. spp., Tertiary of Piedmont, &c., SACCO, Moll. ter. terz. Piemonte, viii, pp. 6 & 9, figs.

†*Ficula oligoficoides*, *oligoreticulata*, *pliocingulata*, (*Fusoficula*) *apenninica*, n. spp., Tertiary of Piedmont, SACCO, Moll. ter. terz. Piemonte, viii, pp. 27-38, figs.

†*Malea proorbiculata*, n. sp., Tertiary of Piedmont, SACCO, Moll. ter. terz. Piemonte, viii, p. 21, fig.

## CYPRÆIDÆ.

*Ovulidæ* and *Cypræidæ* of the Coast of the Department du Var ; MOLLERAT, Bull. Soc. Mal. Fr. vii, p. 103.

*Cypræa* : nervous system ; BOUVIER, Ann. Sci. Nat. xii, pp. 15-37, fig.

†*Trivia canariensis*, n. sp., Tertiary Grand Canary, ROTHPLETZ & SIMONELLI, Z. geol. Ges. xlii, p. 715, fig.

## STROMBIDÆ.

†*Pterocera shumardi*, n. sp., Cretaceous of Texas, HILL (185).

*Strombus yerburyi*, Aden, SMITH, P. Z. S. 1891, p. 418, fig. ; †*S. ? crassaliratus*, Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 416, fig. : n. spp.

## APORRHAIIDÆ.

†*Alaria acute-carinata*, n. sp., Tithonian of Rio Malargue, Argent. Repub. ; BEHRENDSEN, Z. geol. Ges. xliii, p. 413.

†*Aporrhais pleurotomoides*, Cretaceous of Syria, BLANCKENHORN, (21) p. 115, fig. ; †*A. rapax*, Cretaceous of Bohemia, BOEHM, Palæontogr. xxxviii, p. 60, fig. ; †*A. speciosa*, Schl., from Lr. Oligocene of N. Germany, KOENEN, Abh. Geol. specialkarte Preuss. x, heft 3, p. 695, fig. : n. spp.

†*Araeodactylus*, n. n. for *Ischnodactylus*, Cossmann, non Chevrolat ; HARRIS & BURROWS, (168) p. 112.

†*Ceratosiphon caroli-fabricii*, n. sp., Senonian of Friuli, TOMMASI, Atti Ist. Venet. vii, II, p. 1095, fig.

†*Cultrigera rauffi*, n. sp., Cretaceous of Upper Bavaria, BOEHM, Palæontogr. xxxviii, p. 61, fig.

†*Helicaulax falcata*, n. sp., Cretaceous of Upper Bavaria, BOEHM, Palæontogr. xxxviii, p. 61, fig.

†*Lispodesthes magnifica*, n. sp., Cretaceous of Upper Bavaria, BOEHM, Palæontogr. xxxviii, p. 62, fig.

†*Spinigera paueri*, n. sp., Cretaceous of Upper Bavaria, BOEHM, Palæontogr. xxxviii, p. 61, fig.



## CERITHIIDÆ.

Monograph; KÜSTEN & CLESSIN in MARTINI & CHEMNITZ, i, Abth. 26.

†*Cerithiidae* [including one species of *Aporrhais*!] from the Lower Oligocene of N. Germany; KOENEN, Abh. Geol. specialkarte Preuss. x, Hft. 3, pp. 643-708, figs.

†*Cerithiopsis cretacea*, n. sp., Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 431, fig.

*Cerithium yerburyi*, Aden, SMITH, P. Z. S. 1891, p. 417, fig.; +*C. filigrana*, *tenuicosta*, *rarinodum*, *semireticulatum*, *trisulcatum*, *tritoniforme*, *C. ? nassoides*, *C. (Bittium) granuliferum*, (*Cerithiopsis*) *fenestratum*, (*Lovenella*) *dactylus*, *sufflatum*, *terebraforme*, *acuarium*, *bilineatum*, *densicosta*, *raricostatum*, *crassisculptum*, *bispiratum*, *perspiratum*, *spicula*, *decurtatum*, *oblatum*, *detruncatum*, *planistria*, *latterfense*, *obliteratum*, *thiaratum*, Lower Oligocene of N. Germany, KOENEN, Abh. Geol. specialkarte Preuss. x, Hft. 3, pp. 644-686, figs.; +*C. bodenbenderi*, Lias of Portezuelo, Argentine Republic, BEHRENDSEN, Z. geol. Ges. xliii, p. 382, fig.; +*C. conradi*, Cretaceous Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 428, fig.; +*C. de-stefani*, Oligocene of Sicily, CIOFALO, Atti Acc. Gioen. ii, p. 89, fig.; +*C. glabrum*, *acute-costatum*, *fraasi*, *nötlingi*, *aquisulcatum*, *aciforme*, n. spp., Cretaceous of Syria, BLANCKENHORN, (21) pp. 110-115, figs.; +*C. margaritæ*, Senonian of Friuli, TOMMASI, Atti Ist. Venet. vii, II, p. 1096, fig. : n. spp.

✓*Cyrbasia*, n. n. for *Tiarella*, Cossmann, non Swainson; HARRIS & BURROWS, (168) p. 112.

✓*Epetrium*, n. n. for *Stylia*, Jousseau, non Robineau-Desvoidy; HARRIS & BURROWS, (168) p. 112.

†*Mesostoma cancellatum*, *nodosum*, *alternans*, *conicum*, *pusillum*, *gracile*, n. spp., Lower Oligocene of N. Germany, KOENEN, Abh. Geol. specialkarte Preuss. x, Hft. 3, pp. 699-707, figs.

✓*Ogivia*, n. n. for *Metalepsis*, Jousseau, non Grote; HARRIS & BURROWS, (168) p. 112.

†*Potamides ? distortus*, n. sp., Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 429, fig.

✓*Teleostoma*, n. n. for *Pterostoma*, Deshayes, non Germar; HARRIS & BURROWS, (168) p. 112.

†*Triforis bigranosa*, *praelonga*, *elatior*, *vermicularis*, n. spp., Lower Oligocene of N. Germany, KOENEN, Abh. Geol. specialkarte Preuss. x, Hft. 3, pp. 688-694, figs.

†*Vertagus coloratus*, n. sp., Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 429, fig.

## NERINEIDÆ.

†*Nerinea (Ptygmatis) brevivoluta*, n. sp., Inf. Oolite of Britain, HUDLESTON, Pal. Soc. p. 225, fig.; +*N. subgigantea*, *cedrorum*, *uniplicata*, 1891. [VOL. XXVIII.]

*berytensis*, *lütlickei*, *minima*, Cretaceous of Syria, BLANCKENHORN, (21) pp. 105-109, figs. ; †*N. titania*, *euphyes*, (*Ptygmatis*) *loculata*, Neocomian of Mexico, FELIX, Palæontogr. xxxvii, pp. 169-170, fig. : n. spp.

#### VERMETIDÆ.

†*Laxispira trochleata*, n. sp., Cretaceous of Upper Bavaria, BOEHM, Palæontogr. xxxviii, p. 65, fig.

†*Montfortia*, n. subg., with *M. ligustica*, n. sp., Lower Pliocene of Borzoli ; CAMPANA, Atti Soc. Ligust. i, pp. 139 & 140, fig.

†*Siliquaria striolata*, *squamulosa*, n. spp., Lower Oligocene of N. Germany, KOENEN, Abh. Geol. specialkarte Preuss. x, Hft. 3, pp. 745 & 746, figs.

†*Thylacodes medusæ*, n. sp., Japan, PILSBRY, P. Ac. Philad. 1891, p. 471, figs.

†*Vermetus crassisculptus*, *calcaratus*, *varicosus*, *affixus*, *foliaceus*, *crinitus*, *nummulus*, *bilobatus*, *dilatatus*, *cellulosus*, *filifer*, *fasciatus*, *helicoides*, *mammillatus*, *spinifer*, *crassus*, *tumidus*, n. spp., Lower Oligocene of N. Germany, KOENEN, Abh. Geol. specialkarte Preuss. x, Hft. 3, pp. 729-744, figs.

#### TURRITELLIDÆ.

†*Turritellidæ* from the Lower Oligocene of N. Germany ; KOENEN, Abh. Geol. specialkarte Preuss. x, Hft. 3, pp. 709-817, figs. [Includes *Scalaria*.]

†*Glauconia frechi*, n. sp., Cretaceous of Syria ; BLANCKENHORN, (21) p. 101, fig.

†*Mathilda exigua*, n. sp., Lower Oligocene of N. Germany, KOENEN, Abh. Geol. specialkarte Preuss. x, Hft. 3, p. 723, fig.

†*Mesulia gazellensis*, n. sp., Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 424, fig.

†*Tubulostium* ? *rugosum*, n. sp., Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 424, fig.

*Turritella incolor*, Kerguelen Is., SMITH, P. Z. S. 1891, p. 437, fig. ; †*T. betmerensis*, *damesi*, *kokeni*, Cretaceous of Syria, BLANCKENHORN, (21) p. 99, figs. ; †*T. dorsetensis*, (*Mathilda*) *abbas*, *strangulata*, Inf. Oolite of Britain, HUDLESTON, Pal. Soc. pp. 228-233, figs. ; †*T. trilia*, Cretaceous of Upper Bavaria, BOEHM, Palæontogr. xxxviii, p. 65, fig. ; †*T. turgida*, *beyrichi*, n. spp., *T. infundibulum*, n. n. [= *T. crenulata* pars., v. Koen., non Nyst.], Lower Oligocene of N. Germany, KOENEN, Abh. Geol. specialkarte Preuss. x, Hft. 3, pp. 714-716, figs.

#### PSEUDOMELANIIDÆ.

†To this family HUDLESTON, (194) p. 251, considers the Oolitic species at present placed under "*Phasianella*" may probably belong.

†*Loxonema conicum*, Devonian, S. of England, WHIDBORNE, Pal. Soc.

p. 180, fig. ; †*L. salomonense, tzvetaevi, plicatissimum, varicosum, pupoidum, pseudomorphum, heteromorphum*, Fusulina Limestone, Province of Palermo, GEMMELLARO, Giorn. Sci. Palerm. xx, pp. 57-61, figs. : n. spp.

†*Macrocheilus subulitoides, sosisiensis, chemnithiæformis, adrianensis, subzonatus, intusplicatus, conicus, barroisi, brancoi*, n. spp., Fusulina Limestone, Province of Palermo, GEMMELLARO, Giorn. Sci. Palerm. xx, pp. 63-69, figs.

†*Macrochilina elevata, ejecta, cyclostoma*, n. spp., Devonian, S. of England, WHIDBORNE, Pal. Soc. pp. 170 & 171, figs.

†*Pseudomelania astonensis, burtonensis*, n. spp., Inf. Oolite of Britain, HUDLESTON, Pal. Soc. pp. 245 & 246, figs.

†*Spanionema*, n. g., type *Loxonema scalaroides*, Whidb.; WHIDBORNE, Pal. Soc. p. 184, fig.

†*Strobeus elegans*, n. sp., Fusulina Limestone, Province of Palermo, GEMMELLARO, Giorn. Sci. Palerm. xx, p. 62, figs.

#### MELANIIDÆ.

*Melania obliterans*, Moluccas, BÖTTGER, Ber. Senck. Ges. 1891, p. 283, fig. ; *M. (? Goniobasis) acutifilosa*, California, STEARNS, P. U. S. Nat. Mus. xiii, p. 211, fig. : n. spp.

†*Melanopsis eleis*, n. sp., *M. pseudocostata*, n. n. for *M. costata*, Neumayr, and *M. conemenosiana* (Böttg. in lit.), Neogene of Greece, OPPENHEIM, Z. geol. Ges. xliii, pp. 465-469, figs. ; †*M. böttgeri*, n. sp., Tertiary of Bohemia, KLIKA, Arch. naturw. Landesforsch. Böhmen, vii, No. 4, p. 112, fig.

*Pachychilus indifferens*, Guatemala, CROSSE & FISCHER, J. de Conch. xxxi, p. 25 ; *P. subexaratus*, Guatemala, *id. t. c.* p. 216 : n. spp.

*Paludomus palawanicus*, n. sp., Philippines, BROT, Naut. v, p. 17.

*Tiphobia*, for which Ancey proposed to substitute *Hilacantha*, stands ; SMITH, J. de Conch. xxxi, p. 21.

#### PLEUROCERIDÆ.

†*Goniobasis allardi*, n. sp., Danien of Saint-Remy, NICOLAS, C.R. Ass. Fr. Sci. 1890, ii, p. 358, fig.

*G. catenaria*, Say, notes and synonymy ; PILSBRY, Naut. iv, p. 124. *G. crandalli*, Pils., figured ; *op. cit.* v, pl. ii.

†*Trypanostoma ornata*, n. sp., Danien of Saint-Remy, NICOLAS, C.R. Ass. Fr. Sci. 1890, ii, p. 359, fig.

#### LITTORINIDÆ.

*Littorina acutispira, infans*, Port Jackson, SMITH, P. Z. S. 1891, pp. 487 & 488, figs. ; *L. insularum*, Mediterranean, LOCARD, Ann. Soc. L. Lyon, xxxvii, p. 190 ; †*L. ussheri*, Devonian, S. of England, WHIDBORNE, Pal. Soc. p. 188, fig. : n. spp.

*L. fusciventris*, described as n. sp. from E. Java, p. 251, = *L. columellaris*, Orb., p. 311; BËTTGER, Ber. Senck. Ges. 1891, fig.

†*Portlockia decorata*, n. sp., Fusulina Limestone, Province of Palermo, GEMMELLARO, Giorn. Sci. Palerm. xx, p. 88, fig.

*Tectarius atyphus*, n. sp., Manta, Ecuador, STEARNS, P. U. S. Nat. Mus. xiv, p. 326.

## FOSSARIDÆ.

†*Fossariopsis antiqua*, *F. cosmoconcha*, n. spp., Fusulina Limestone, Province of Palermo, GEMMELLARO, Giorn. Sci. Palerm. xx, pp. 69 & 70, figs.

## SOLARIIDÆ.

†*Euomphalus neapolitanus*, *E. ? araneifer*, Devonian, S. of England, WHIDBORNE, Pal. Soc. pp. 252 & 253, figs.; †*E. flexistriatus*, *maskusi*, Devonian of the Mackenzie River Basin, WHITEAVES, Geol. Surv. Canada, Contribution to Canadian Palæont. i, pp. 242 & 243, figs.; †*E. manitobensis*, Devonian of Manitoba, WHITEAVES, Tr. R. Soc. Canada, viii, Sect. 4, p. 100, fig.; †*E. telleri*, St. Cassian Beds, KITTL, Ann. Hofmuseum Wien, vi, p. 226, fig. : n. spp.

*Solarium atkinsoni*, Challenger Station 164 B, off Sydney, SMITH, P. Z. S. 1891, p. 441, fig.; *S. (Torinia) enoshimense*, Japan, MELVILL, J. de Conch. vi, p. 411, fig. : n. spp.

## LITIOPIDÆ.

*Diala magna*, n. sp., Victoria, Australia, TATE, Tr. R. Soc. S. Austr. xiv, p. 259, fig.

## RISOIIDÆ.

*Cingula obesa*, n. sp., English Channel, LOCARD, Ann. Soc. L. Lyon, xxxvii, p. 175.

~ *Cossmannia*, n. n. for *Diastictus*, COSSMANN, preoccupied; NEWTON, (298) p. 233.

## HYDROBIIDÆ.

*Paludestrinidæ* (n. n.) is proposed for *Hydrobiidæ* since the name of the type genus *Hydrobia* is preoccupied, and d'Orbigny's name, *Paludestrina* revived; NEWTON (298) p. 226.

*Amnicola orizabensis*, n. sp., Vera Cruz, CROSSE & FISCHER, J. de Conch. xxxi, p. 24.

*Bythinia tentaculata*, development; ERLANGER, Zool. Anz. 1891, p. 385.

*Bythinella solidula*, *melanostoma*, *fuscata*, *longula*, n. spp., Trencsin [near Vienna], BRANCSIK, Math. term. köz. xxiv, pp. 33 & 34, figs.

†*Gangetia*, n. g., type *Hydrobia miliacea*, NEVILL; ANCEY, Bull. Soc. Mal. Fr. vii, pp. 162 & 163.

*Lithoglyphus gredleri*, n. sp., Reifnitz [near Laibach] in Krain; KOBELT in ROSSMAESSLER's Iconographie, v, p. 35, fig.

*Paludinella (Bythinella) paulucciæ*, n. sp., Mantua; PICAGLIA, Atti Soc. Mod. x, p. 53.

† *Ponsonbya*, n. g., *P. leucoraphe*, n. sp., Lake Tanganyika, ANCEY, Bull. Soc. Mal. Fr. vii, p. 347.

*Potamopyrgus bakeri*, n. sp., Mexico, PILSBRY, P. Ac. Philad. 1891, p. 328, figs., and Naut. v, p. 9.

*Pyrgulopsis (?) patzcuarensis*, n. sp., Mexico, PILSBRY, P. Ac. Philad. 1891, p. 330, figs., also Naut. v, p. 9.

† *Subulina nitidula*, n. sp., Tertiary of Bohemia, KLIKA, Arch. naturw. Landesforsch. Böhmen, vii, No. 4, p. 70, fig.

#### PALUDINIDÆ.

*Cleopatra mangoroensis*, n. sp., River Mangoro (Madagascar), ANCEY, Bull. Soc. Mal. Fr. vii, p. 344.

*Neothauma*: the development of the labial sinus is merely of specific importance; the name will pass into the synonymy of *Viviparus*; SMITH, Ann. N. H. viii, p. 323.

*Paludina vivipara*, development; ERLANGER, Morph. JB. xvii, pp. 337-379 & 636-680, 6 pls., and Zool. Anz. xiv, pp. 68-70 & 280-283.

† *Vivipara lacedæmoniorum*, n. sp., Neogene [near Sparta], OPPENHEIM, Z. geol. Ges. xliii, p. 461, fig.

#### VALVATIDÆ.

† *Valvata vivipariformis, philippsoni*, n. spp., Neogene, Greece, OPPENHEIM, Z. geol. Ges. xliii, pp. 463 & 473, figs.

#### AMPULLARIIDÆ.

*Ampullaria*: distribution in Southern Brazil; JHERING, Nachr. mal. Ges. 1891, p. 93: respiration; BOUVIER, Le Nat. 1891, p. 143.

*A. petiti*, n. sp., Amazon River, CROSSE, J. de Conch. xxi, p. 214, fig.

*Lanistes congicus*, n. sp., Congo, BËTTGER in SCHEPMAN, Notes Leyd. Mus. xiii, p. 111, fig.

#### ASSIMINEIDÆ.

*Acmella decolor*, n. sp., Moluccas, BËTTGER, Ber. Senck. Ges. 1891, p. 297, fig.

#### CYCLOPHORIDÆ.

*Alycaeus celebensis*, n. sp., Celebes, MARTENS, (246) p. 217.

† *Arinia distans*, n. sp., Danien of Saint-Remy, NICOLAS, C.R. Ass. Fr. Sci. 1890, ii, p. 357, fig.

*Bellardiella minor*, n. sp., British New Guinea, HEDLEY, P. Linn. Soc. N.S.W. vi, p. 102, fig.

† *Callianella*, n. n. for *Callia*, Gray, preoccupied; NEWTON, (298) p. 250.

*Cyathopoma cornu*, n. sp., Siquijor Is. (Philippines), MOELLENDORFF, Nachr. mal. Ges. 1891, p. 48.

*Cyclophorus moellendorffi*, Formosa, SCHMACKER & BÆTTGER, Nachr. mal. Ges. 1891, p. 191, fig.; *C. songmaensis*, pp. 27 & 250, fig., *massiei*, p. 251, fig., Tonquin, MORLET, J. de Conch. xxxi : n. spp.

*Cyclotus atratus*, Sangir Is., ANCEY, Bull. Soc. Mal. Fr. vii, p. 149; *C. floresianus*, Flores, p. 211, *biangulatus*, Saleyer Is., p. 214, figs., MARTENS (246); *C. harucuanus*, Moluccas, BÆTTGER, Ber. Senck. Ges. 1891, p. 295, fig.; *C. horridus*, *kowaldi*, *belfordi*, Brit. New Guinea, HEDLEY, P. Linn. Soc. N.S.W. vi, pp. 108 & 109, fig. : n. spp.

*Diancta torta*, n. sp., Moluccas, BÆTTGER, Ber. Senck. Ges. 1891, p. 288, fig.

*Diplommatina nodifera*, *subfusiformis*, *vesicans*, Siquijor Is. (Philippines), MOELLENDORFF, Nachr. mal. Ges. 1891, pp. 54-56; *D. stollii*, N.W. Guatemala, MARTENS, Biol. Centr. Am., Moll. p. 20, fig.; *D. strubelli*, Moluccas, BÆTTGER, Ber. Senck. Ges. 1891, p. 285, fig.; *D. symmetrica*, Brit. New Guinea, HEDLEY, P. Linn. Soc. N.S.W. vi, p. 107, fig.; *D. (Sinica) ventriculus*, *D. diminuta*, Perak, MOELLENDORFF, P. Z. S. 1891, pp. 343 & 344, figs.; † *D. diezi*, Upper Miocene, Regensburg, FLACH, Verh. Ges. Würzb. xxiv (1890) No. 3, p. 10, fig.; † *D. primordialis*, *daniensis*, *intermedia*, Danien of Saint-Remy, NICOLAS, C.R. Ass. Fr. Sci. 1890, ii, pp. 355 & 356, figs. : n. spp.

*Ditropis ingenua*, *moellendorffi*, *spiralis*, Moluccas, Ber. Senck. Ges. 1891, pp. 292 & 293, figs.; *D. mira*, Siquijor Is. (Philippines), MOELLENDORFF, Nachr. mal. Ges. 1891, p. 50 : n. spp.

*Hargravesia philippinica*, n. sp., Siquijor Is. (Philippines), MOELLENDORFF, Nachr. mal. Ges. 1891, p. 51.

† *Hartmannia*, n. n. for *Pomatias*, which is to stand instead of *Cyclostoma*; NEWTON, Ann. N. H. vii, p. 345 [see also NORMAN, t. c. p. 447, NEWTON, t. c. p. 522, and NORMAN, op. cit. viii, p. 176].

† *Ischurostoma acuminatum*, n. sp., Tertiary of Saint-Remy, CAZIOT, Bull. Soc. Mal. Fr. vii, p. 141, fig.

† *Lagochilus grandipilum*, n. n. for *L. longipilum*, Bttgr., non Moell.; BÆTTGER, Ber. Senck. Ges. 1891, p. 249.

*L. tigrinulum*, n. sp., Siquijor Is. (Philippines), MOELLENDORFF, Nachr. mal. Ges. 1891, p. 50.

*Leptopoma parvum*, n. sp., Brit. New Guinea, HEDLEY, P. Linn. Soc. N.S.W. vi, p. 111, fig.

† *Megalomastoma depereti*, Tertiary of Saint-Remy, CAZIOT, Bull. Soc. Mal. Fr. vii, p. 140, fig.; † *M. elongata*, *exigua*, Danien of Saint-Remy, NICOLAS, C.R. Ass. Fr. Sci. 1890, ii, pp. 357 & 358, figs. : n. spp.

*Palaina angulata*, *carbavica*, n. spp., Moluccas, BÆTTGER, Ber. Senck. Ges. 1891, p. 286, figs.

*Pomatias*, as a generic name, must supersede *Cyclostoma*; the species at

present under *Pomatias* to be ranged under *Hartmannia*, n. n. ; NEWTON, Ann. N. H. vii, p. 345. The change is objected to by NORMAN, t. c. p. 447 ; and again urged by NEWTON, t. c. p. 522. NORMAN rejoins, *op. cit.* viii, p. 176.

*P. montsiccianus*, *rudicosta*, n. spp., Catalonia, Bull. Soc. Mal. Fr. vii, pp. 277 & 278.

*Pupina brenchleyi*, Lugunor Is. (Carolines), SMITH, P. Z. S. 1891, p. 490, fig. ; *P. lobifera*, Sumatra, MARTENS, (246) p. 218, fig. ; *P. ovalis*, Brit. New Guinea, HEDLEY, P. Linn. Soc. N.S.W. vi, p. 106, fig. : n. spp.

*Pupinella tapparonei*, n. sp., Brit. New Guinea, HEDLEY, P. Linn. Soc. N.S.W. vi, p. 106, fig.

*Rolleia*, n. g., type *Cyclotus martensi*, Maltz. ; CROSSE, J. de Conch. xxxi, p. 162, fig.

#### CYCLOSTOMATIDÆ.

† *Bauxia*, n. g., with *B. viviparæformis*, *boulayi*, *bourguignati*, *allardi*, *rouleana*, *necra*, *pellati*, n. spp., Tertiary of Baux ; CAZIOT, Bull. Soc. Mal. Fr. vii, pp. 135-139, figs.

*Cyclostoma*, as a generic name, must be abandoned for *Pomatias* ; NEWTON, Ann. N. H. vii, p. 345. The change is objected to by NORMAN, t. c. p. 447 ; and again urged by NEWTON, t. c. p. 522. NORMAN rejoins, *op. cit.* viii, p. 176.

*C. transvaalense*, n. sp., Pretoria, MELVILL & PONSONBY, Ann. N. H. viii, p. 237.

*Omphalotropis brazieri*, *protracta*, British New Guinea, HEDLEY, P. Linn. Soc. N.S.W. vi, p. 101, figs. ; *O. carolinensis*, Lugunor Is. (Carolines), SMITH, P. Z. S. 1891, p. 490, fig. ; *O. ornata*, Moluccas, BËTTGER, Ber. Senck. Ges. 1891, p. 296, fig. : n. spp.

† *Paratropis*, n. sect. of *Omphalotropis*, type *O. ornata* ; BËTTGER, Ber. Senck. Ges. 1891, p. 296.

#### ACICULIDÆ.

*Acme* : mode of life ; GALLENSTEIN, Nachr. mal. Ges. 1891, p. 110.

† *Acme diezi*, *isselii*, Upper Miocene, Regensburg, FLACH, Verh. Ges. Würzb. xxiv (1890) No. 3, p. 11, figs. ; † *A. lævissima*, Tertiary of Bohemia, KLIKA, Arch. naturw. Landesforsch. Böhmen, vii, No. 4, p. 18, fig. : n. spp.

#### HIPPONYOIDÆ.

† *Rothpletzia*, n. g., allied to *Hipponyx*, *R. rudista*, n. sp., Tertiary, Grand Canary ; ROTHPLETZ & SIMONELLI, Z. geol. Ges. xlii, p. 711, fig.

#### CAPULIDÆ.

*Addisoniidae* : monograph ; PILSBRY in TRYON'S Manual, xii, 1890, pp. 138-140. Single genus and species, which Pilsbry, following Dall, classes with the *Rhipidoglossa*.

*Capulus compressus*, off W. Coast of S. Patagonia, SMITH, P. Z. S. 1891, p. 437, fig.; †*C. ? invictus*, *pericompsus*, *puellaris*, *terminalis*, *ussleri*, *tylotus*, *guleritus*, Devonian, S. of England, WHIDBORNE, Pal. Soc. pp. 204-217, figs. : n. spp.

*Crepidula fornicata*, embryology; CONKLIN, Johns Hopk. Univ. Circ. x, p. 89.

†*Cyclothyca*, n. subg. of *Capulus*; type, *C. corrugata*, n. sp., W. Coast of Nicaragua; STEARNS, P. U. S. Nat. Mus. xiii, p. 212, fig.

†*Metoptoma ? minneiskensis*, *M. ? peracuta*, n. spp., Cambrian of U. S., WALCOTT, P. U. S. Nat. Mus. xiii, p. 267, fig.

†*Orthonychia quadrangularis*, n. sp., Devonian, S. of England, WHIDBORNE, Pal. Soc. p. 223, fig.

†*Platyceras hoyti*, *P. texanum*, n. spp., Cambrian of U. S., WALCOTT, P. U. S. Nat. Mus. xiii, p. 268, figs.

#### NARICIDÆ.

†*Micreschara*, n. n. for *Escharella*, COSSMANN, non D'Orbigny; COSSMANN, Ann. Géol. Univ. Paris, v, 1889, p. 1096.

†*Vanikoro neritopsoides*, n. sp., Cretaceous of Syria, BLANCKENHORN, (21) p. 102.

#### NATICIDÆ.

†Tertiary forms from Piedmont and Liguria, with tables of the phylogenetic relationships of the species; SACCO, Moll. ter. terz. Piemonte, viii & ix.

†*Naticidæ* from the Lower Oligocene of N. Germany; KOENEN, Abh. Geol. specialkarte Preuss. x, Hft. 3, pp. 575-598, figs.

†*Amauropsis amoena*, n. sp., Cretaceous of Upper Bavaria, BOEHM, Palæontogr. xxxviii, p. 64, fig.

†*Ampullina superstes*, n. sp., Lower Oligocene of N. Germany, KOENEN, Abh. Geol. specialkarte Preuss. x, Hft. 3, p. 596, fig.

*Natica*: method of perforating bivalves; SCHIEMENZ, MT. z. Stat. Neap. x, p. 153, fig.

†*N. battagliae*, Oligocene of Sicily, CIOFALO, Atti Acc. Gioen, ii, p. 89, fig.; †*N. infelix*, *epiglopardalis*, *virguloides*, *N. (Polinices) miocolligens*, *dertomamilla*, *proredempta*, *redemptoaurantia*, Tertiary, Piedmont, &c., SACCO, Moll. ter. terz. Piemonte, viii, pp. 44-96, figs.; †*N. lacunoides*, *semperi*, *angystoma*, *lunulifera*, Lower Oligocene of N. Germany, KOENEN, Abh. Geol. specialkarte Preuss. x, Hft. 3, pp. 578-585, figs.; †*N. (Ampullina) fluctuoides*, *minima*, Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, pp. 417 & 418, fig.; †*N. (Lunatia) omeacalli*, Neocomian of Mexico, FELIX, Palæontogr. xxxvii, p. 169, fig.; †*Natica ? (Euspira) protracta*, Inf. Oolite of Britain, HUDLESTON, Pal. Soc. p. 265, fig. : n. spp.

†*Naticina fissurata*, n. sp., KOENEN, Abh. Geol. specialkarte Preuss. x, Hft. 3, p. 595, fig.



†*Neverila patula*, n. sp., Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 419, fig.

†*Sigaretus oligopolitus, cryptostomoides*, *S. (Cryptostoma) sigaretoides*, Tertiary of Piedmont, SACCO, Moll. ter. terz. Piemonte, viii, pp. 100–102, figs.; †*S. rotundatus*, Lower Oligocene of N. Germany, KOENEN, Abh. Geol. specialkarte Preuss. x, Hft. 3, p. 597, fig. : n. spp.

†*Tylostoma martini*, n. sp., Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 439, fig.

## PTENOGLOSSA.

### SCALARIIDÆ.

†Tertiary forms from Piedmont, with tables of the phylogenetic relationships of the species; SACCO, Moll. ter. terz. Piemonte, ix.

†*Scalaridae* included with *Turritellidae*, the forms found in the Lower Oligocene of N. Germany, described by KOENEN, Abh. Geol. specialkarte Preuss. x, Hft. 3, pp. 747–812, figs.

†*Acirsa grandis, robusta, turris, angusta, pusilla, plicatula, angulata, sulcata, coarctata, rugata, crassa, plana*, n. spp., Lower Oligocene of N. Germany, KOENEN, Abh. Geol. specialkarte Preuss. x, Hft. 3, pp. 789–808, figs.

†*Acirsella pervaricosa*, n. sp., Lower Oligocene of N. Germany, KOENEN, Abh. Geol. specialkarte Preuss. x, Hft. 3, p. 810, fig.

†*Aclis proascaris*, n. sp., Tertiary of Piedmont, SACCO, Moll. ter. terz. Piemonte, ix, p. 95, fig.

†*Acrilla curta*, n. sp., Lower Oligocene of N. Germany, KOENEN, Abh. Geol. specialkarte Preuss. x, Hft. 3, p. 758, fig.

†*Antitrochus*, n. g.; type, *A. arietinus*, n. n. [= *Scalaria antiqua*, Whidb., non Münster]; WHIDBORNE, Pal. Soc. pp. 234 & 235, figs.

†*Cirsotrema subregularis, C. incrassata, rotula*, n. spp., *C. peracuta*, n. n. [= *acuta*, Koenen, non Sow.], Lower Oligocene of N. Germany; KOENEN, Abh. Geol. specialkarte Preuss. x, Hft. 3, pp. 750–756, figs.

†*Clathroscala obeliscus, limatula, teretior*, n. spp., Lower Oligocene of N. Germany; KOENEN, Abh. Geol. specialkarte Preuss. x, Hft. 3, pp. 781–785, figs.

†*Crassiscala gibbosa, rugulosa*, n. spp., Lower Oligocene of N. Germany; KOENEN, Abh. Geol. specialkarte Preuss. x, Hft. 3, pp. 777–779, figs.

†*Elasmonema rotundum*, n. sp., Devonian, S. of England, WHIDBORNE, Pal. Soc. p. 273, fig.

†*Holopella tenuireticulata*, n. sp., Devonian, S. of England, WHIDBORNE, Pal. Soc. p. 224, fig.

*Scala*: as a generic name has precedence over *Scalaria*; NEWTON, Ann. N. H. vii, p. 345. (See also NORMAN, t. c. p. 447; NEWTON, t. c. p. 522, and NORMAN, op. cit. viii, p. 176.)

†*Scalaria crinita, multicosta, insignita, fusulina, subtilis, angulifera, umbilicata, millegramosa, quadricincta*, n. spp., *S. exigua*, n. n. [= *pusilla*,

Koenen, non Phil.], Lower Oligocene of N. Germany; KOENEN, Abh. Geol. specialkarte Preuss. x, Hft. 3, pp. 759-774, figs. †*S. (Clathrus) mioatavus*, (*Parviscala*) *pliosubappennina*, (*Opalia*) *miotaurina*, (*Sthenorytis*) *proglobosa*, *globosocaspina*, (*Cirsotrema*) *gassinense*, *eoauriculatum*, *rovasendæ*, *eovaricosum*, (*C. ?*) *sthenorytoides*, *pseudoretusum*, (*C.*) *sthenoryto-crispum*, *abberans*, *antiquovaricosum*, *eosubvaricosum*, *taurovaricosum*, *mioparicosum*, (*Acrilla*) *plioamœna*, *leptoglyptamœna*, *interposita*, (*Turriscala*) *sublamarchi*, (*Nodiscala*) *pseudocarinata*, (*Dentiscala*) *procrenata*, (*Hemiacirsa*) *prolanceolata*, *taurulanceolata*, (*Acrisa*) *miopedemontana*, Tertiary of Piedmont, SACCO, Moll. ter. terz. Piemonte, ix, pp. 20-93, figs.; †*S. be-wertensis*, *novemvaricosa*, Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 421 & 422, figs.; *S. ballinensis*, Ballina, N. S. Wales, SMITH, Ann. N. H. vii, p. 139; *S. distincta*, Challenger Station 164 B, off Sydney, *id.* P. Z. S. 1891, p. 441, fig.; *S. jousseauumei*, French Atlantic coast, LOCARD, Ann. Soc. L. Lyon, xxxvii, p. 126 : n. spp.

## GYMNOGLOSSA.

## EULIMIDÆ.

†*Eulimidæ* from the Lower Oligocene of N. Germany; KOENEN, Abh. Geol. specialkarte Preuss. x, Hft. 3, pp. 633-642, figs.

†*Eulima auriculata*, *mikrostoma*, Lower Oligocene of N. Germany, KOENEN, Abh. Geol. specialkarte Preuss. x, Hft. 3, pp. 633-637, figs.; †*E. puncturata*, Cretaceous of Upper Bavaria, BOEHM, Palæontogr. xxxviii, p. 64, fig. : n. spp.

†*Niso acuta*, *rotundata*, Lower Oligocene of N. Germany, KOENEN, Abh. Geol. specialkarte Preuss. x, Hft. 3, pp. 640 & 641, figs.; *N. chevreuxi*, Senegal, DAUTZENBERG, Mém. Soc. Zool. iv, p. 50, fig.; †*N. (Vetotuba) brazieri*, Upper Silurian of Victoria, ETHERIDGE, Rec. Austral. Mus. i, p. 62, fig. : n. spp.

## PYRAMIDELLIDÆ.

†*Pyramidellidæ* from the Lower Oligocene of N. Germany; KOENEN, Abh. Geol. specialkarte Preuss. x, Hft. 3, pp. 599-632, figs.

†*Eulimella solida*, *lineolata*, Lower Oligocene of N. Germany, KOENEN, Abh. Geol. specialkarte Preuss. x, Hft. 3, pp. 607 & 608, figs.; *E. monili-forme*, Sydney, HEDLEY & MUSSON, P. Linn. Soc. N.S.W. vi, p. 247, fig. : n. spp.

†*Obeliscus zitteli*, n. sp., Cretaceous of Upper Bavaria, BOEHM, Palæontogr. xxxviii, p. 63, fig.

†*Odontostoma dunkeri*, *tumidum*, *intortum*, *erectum*, *pingue*, n. spp., Lower Oligocene of N. Germany, KOENEN, Abh. Geol. specialkarte Preuss. x, Hft. 3, pp. 611-617, figs.

*Odostomia (Turbonilla) fischeri*, *O. consanguinea*, *constricta*, n. spp., Challenger Station 164 B, off Sydney, SMITH, P. Z. S. 1891, p. 441, figs.

†*Odostomopsis*, n. g., type *Phasianella abeihensis*; BLANCKENHORN (21).

†*Pyramidella amœna, larteti*, n. spp., Cretaceous of Syria, BLANCKENHORN (21) p. 105, fig.

†*Syrnola turrita, terebralis, tumida, turricula, biplicata, tenuiplicata, lanceolata*, n. spp., Lower Oligocene of N. Germany, KOENEN, Abh. Geol. specialkarte Preuss. x, Hft. 3, pp. 600-606, figs.

†*Turbonilla incisa, inflexa, innexa, intumescens, curta, spelta, evoluta, impressa, laticosta, vermicularis, T. ? elata*, n. spp., Lower Oligocene of N. Germany, KOENEN, Abh. Geol. specialkarte Preuss. x, Hft. 3, pp. 621-631, figs.

## SCUTIBRANCHIATA.

### RHIPIDOGLOSSA.

#### PROSERPINIDÆ.

*Despoenidae* and *Despoena*, n. nn. for *Proserpinidae* and *Proserpina*, Sowerby, preoccupied; NEWTON, (298) p. 255.

#### HELICINIDÆ.

†*Calybium*, n. g., *C. massiei*, n. sp., Laos; MORLET, J. de Conch. xxxi, p. 316.

*Helicina badia*, Formosa, SCHMACKER & BËTTGER, Nachr. mal. Ges. 1891, p. 185; *H. bandana*, Moluccas, BËTTGER, Ber. Senck. Ges. 1891, p. 298, fig.; *H. exserta*, Saleyer Is., MARTENS, (246) p. 220, fig.; *H. insularum*, p. 113, *H. multicornata*, p. 115, British New Guinea, HEDLEY, P. Linn. Soc. N.S.W. vi, figs; *H. magdalenæ*, Oahu (Hawaiian Archipelago), ANCEY, Bull. Soc. Mal. Fr. vii, p. 342; *H. succincta, punctisulcata, borealis*, Mexico, MARTENS, Biol. Centr. Am., Moll. pp. 36 & 40, figs.; *H. woodlarkensis*, Woodlark Is., SMITH, Ann. N. H. viii, p. 138 : n. spp.

#### NERITIDÆ.

†*Neritina locrensis*, n. sp., Neogene of Greece, OPPENHEIM, Z. geol. Ges. xliii, p. 474, figs.

†*Nerita abeihensis, bidens, pagoda*, Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, pp. 431 & 432, figs.; †*N. palœomorpha, prisca*, Fusulina Limestone, Province of Palermo, GEMMELLARO, Giorn. Sci. Palerm. xx, pp. 77 & 78, figs. : n. spp.

†*Pileolus spherulitum*, n. sp., Cretaceous of Syria, BLANCKENHORN, (21) p. 98.

√†*Platycheilus*, n. g., for *P. canaliculatus, sturi, pygmæus*, n. spp., Fusulina Limestone, Province of Palermo, GEMMELLARO, Giorn. Sci. Palerm. xx, pp. 79-81, figs.

## NERITOPSIDÆ.

†*Naticopsis waageni*, *mediterranea*, *petricola*, *spallanzanii*, *oncochili-formis*, *plicatella*, *minuta*, n. spp., Fusulina Limestone, Province of Palermo, GEMMELLARO, Giorn. Sci. Palerm. xx, pp. 71-76, figs.

## TURBINIDÆ.

*Astraliium (Pomaulax) wardii*, n. sp., Australia, BAKER, P. Rochester Acad. i, p. 136, fig.

†*Cyclonema lilydalensis*, Upper Silurian of Victoria, ETHERIDGE, Rec. Austral. Mus. i, p. 128, fig.; †*C. ? australis*, Upper Silurian of Victoria, *id. t. c.* pp. 63 & 127, fig.: n. spp.

†*Eunema tyrolensis*, *badiotica*, n. spp., St. Cassian Beds, KITTL, Ann. Hofmuseum Wien, vi, p. 246, fig.

††*Eunemopsis*, n. g., type *Turbo epaphus*, Laube, with *E. dolomitica*, n. sp., St. Cassian Beds; KITTL, Ann. Hofmuseum Wien, vi, pp. 256 & 257, figs.

†*Guilfordia waageni*, n. form, Chalk of Priesen (Bohemia); JAHN, JB. geol. Reichsanst. xli, p. 184, fig.

††*Lacunina*, n. g., type *Turbo bronni*, Wissmann; KITTL, Ann. Hofmuseum Wien, vi, p. 257, fig.

*Leiopyrga octona*, Australia, †*L. quadricingulata*, Miocene of Victoria, †*L. sayceana*, Eocene of Victoria, n. spp., TATE, Tr. R. Soc. S. Austr. xiv, pp. 260 & 261, figs.

†*Oriostoma northi*, n. sp., Upper Silurian of Victoria, ETHERIDGE, Rec. Austral. Mus. i, p. 64, fig.

†*Pachypoma haueri*, *insolitum*, n. spp., St. Cassian Beds, KITTL, Ann. Hofmuseum Wien, vi, pp. 244 & 245, figs.

†“*Phasianella*” *conoidea*, n. sp., Inf. Oolite of Britain, HUDLESTON, Pal. Soc. p. 254, fig. The author regards “*Phasianella*” of the Oolite as most probably belonging to the *Pseudomelaniidæ* (p. 251).

†*Schizogonium laubei*, *impressum*, *elevatum*, *tetrptychum*, n. spp., St. Cassian Beds, KITTL, Ann. Hofmuseum Wien, vi, pp. 217 & 218, figs.

†*Stegonomphalus*, n. n. for *Eudora*, Leach, non Peron & Lesueur; HARRIS & BURROWS, (168) p. 112.

†*Turbo trunensis*, Cretaceous of Upper Bavaria, BOEHM, Palæontogr. xxxviii, p. 68, fig.; †*T. bodenbenderi*, Tithonian of Rodeoviejo, Argentine Republic, BEHRENDSEN, Z. geol. Ges. xliii, p. 413, fig.; †*T. inamictus*, Devonian, S. of England, WHIDBORNE, Pal. Soc. p. 274, fig.: n. spp.

## TROCHIDÆ.

Australian *Trochidæ*; BRAZIER, P. R. Soc. Tasm. 1886 (1887), pp. 193-207.

†*Chrysostoma tornatum*, *planulatum*, *howsei*, n. spp., Fusulina Limestone, Province of Palermo, GEMMELLARO, Giorn. Sci. Palerm. xx, p. 84, fig.

† *Flemmingia granulata*, n. sp., St. Cassian Beds, KITTL, Ann. Hofmuseum Wien, vi, p. 254, fig.

† *Margaritella kokeni*, n. sp., Cretaceous of Upper Bavaria, BOEHM, Palæontogr. xxxviii, p. 68, fig.

*Minolia malcolmia*, *pompiliodes*, *gilvosplendens*, *ceraunia*, *edithæ*, *eili-krines*, Philippines, *henniana*, Magnetic Is., Queensland, MELVILL, Journ. Conch. vi, pp. 406–410, figs. : n. spp.

† *Monodonta antiqua*, n. sp., Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 434, fig.

† *Paleunema*, n. g., type *Pleurotomaria nodosa*, Münst. ; KITTL, Ann. Hofmuseum Wien, vi, p. 245, fig.

† *Plagiothyra*, n. g. of *Trochineæ*, type *Turbo nodosus*, Goldfuss ; WHIDBORNE, Pal. Soc. p. 264, fig.

† *Simochilus*, n. n. for *Platychilus*, Cossmann, non Yokoblev ; HARRIS & BURROWS, (168) p. 112.

*Solariella metallica*, n. sp., Gulf of Manaar, WOOD-MASON & ALCOCK, Ann. N. H. p. 444, fig.

† *Sosiolytes*, n. g. ; *S. schlotheimi*, n. sp., Fusulina Limestone, Province of Palermo ; GEMMELLARO, Giorn. Sci. Palerm. xx, pp. 83 & 84, fig.

† *Stuorella*, n. g. ; type the single sp. *Trochus subconcauus*, Münst. ; KITTL, Ann. Hofmuseum Wien, vi, p. 209, fig.

† *Trachyspira*, n. g., for *T. delphinuloides*, *millegranum*, *acanthicum*, n. spp., Fusulina Limestone, Province of Palermo, GEMMELLARO, Giorn. Sci. Palerm. xx, pp. 89–91, figs.

† *Trochus adrianensis*, Fusulina Limestone, Province of Palermo, GEMMELLARO, Giorn. Sci. Palerm. xx, p. 82, fig. ; † *T. crispus*, Cretaceous of Syria, BLANCKENHORN, (21) p. 98, fig. ; † *T. lissochilus*, n. n. for *T. deslonchampsii*, Laube [non Klipst.], preocc., *T. funiculosus*, *toulai*, St. Cassian Beds, KITTL, Ann. Hofmuseum Wien, vi, pp. 248 & 249, figs. ; † *T. margaritifera*, Cretaceous of Upper Bavaria, BOEHM, Palæontogr. xxxviii, p. 67, fig. ; † *T. pigorinii*, Oligocene of Sicily, CIOFALO, Atti Acc. Gioen. ii, p. 88, fig. ; † *T. striatofundus*, Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 433, fig. ; *T. (Bembix) abyssorum*, Challenger Station 241, N. Pacific, SMITH, P. Z. S. 1891, p. 438, fig. ; † *T. (Scalætrochus) lindströmi*, Upper Silurian of Victoria, ETHERIDGE, Rec. Austral. Mus. i, p. 66, fig. ; † *T. ? saratogensis*, Cambrian of New York, WALCOTT, P. U. S. Nat. Mus. xiii, p. 268, fig. : n. spp.

#### DELPHINULIDÆ.

† *Cælocentrus tubifer*, n. sp., St. Cassian Beds, KITTL, Ann. Hofmuseum Wien, vi, p. 231, fig.

† *Delphinula porteri*, n. sp., Cretaceous of Syria, BLANCKENHORN, (21) p. 97, fig.

*Liotia calliglypta*, n. sp., Thursday Is., MELVILL, J. de Conch. vi, p. 410, fig.

† *Straparollus ultimus*, n. sp., St. Cassian Beds, KITTL, Ann. Hofmuseum Wien, vi, p. 228, fig.

† *Turbonellina striata, granosa*, n. spp., Fusulina Limestone, Province of Palermo, GEMMELLARO, Giorn. Sci. Palerm. xx, pp. 87 & 88, figs.

#### CYCLOSTREMATIDÆ.

*Leucorhynchia tryoni*, n. sp., Singapore, PILSBRY, Naut. v, p. 91.

#### STOMATIIDÆ.

*Stomatellidæ* : monograph. PILSBRY in TRYON'S Manual, xii, 1890, pp. 1-48, includes *Stomatella* (and 2 subg.), *Phaneta*, *Stomatia* (1 subg.), *Gena* (1 subg.), and *Broderipia*.

*Broderipia subiridescens*, n. sp., hab. ? , PILSBRY in TRYON'S Manual, xii, 1890, p. 46, fig.

*Stomatella* : anatomy and dentition ; PILSBRY, P. Ac. Philad. 1891, p. 71, figs.

*Stomatella lyrata*, Japan, p. 12, *montrouzieri*, Is. of Art, New Caledonian Archipelago, p. 27, n. spp., PILSBRY in TRYON'S Manual, xii, 1890, p. 12, fig.

† *Synaptocochlea*, n. subg. of *Stomatella* ; type, *S. stellata*, Souv. ; PILSBRY in TRYON'S Manual, xii, 1890, pp. 6 & 25.

#### COCCULINIDÆ.

Monograph : PILSBRY in TRYON'S Manual, xii, 1890, pp. 131-138, single genus.

#### HALIOTIDÆ.

Monograph : PILSBRY in TRYON'S Manual, xii, 1890, pp. 72-126, divides the single genus into three sections—*Haliotis*, s. s., *Padollus*, and *Teinotis*, and many groups.

#### PLEUROTOMARIIDÆ.

Monograph : PILSBRY in TRYON'S Manual, xii, 1890, pp. 69-72, adopts Fischer's two sections—*Perotrochus* and *Entemnotrochus*—for the single genus, to which he restricts the family.

† *Gosseletina fuchsi*, n. sp., St. Cassian Beds, KITTL, Ann. Hofmuseum Wien, vi, p. 206, fig.

† *Kokenella*, n. g., type *Porcellia fischeri*, M. Hoern., with *K. laubei, klipsteini*, n. spp., St. Cassian Beds ; KITTL, Ann. Hofmuseum Wien, vi, pp. 177 & 178, figs.

† *Laubella*, n. g., type, *Pleurotomaria delicata*, Laube, with *L. minor*, n. sp., St. Cassian Beds ; KITTL, Ann. Hofmuseum Wien, vi, pp. 207 & 208, figs.

†*Leveillia*, nom. mut., for *Porcellia*, Lév., preocc., with *L. latidorsata*, n. sp., Carboniferous Limestone, Ireland; NEWTON, Geol. Mag. 1891, pp. 203 & 206.

†*Murchisonia sosisensis*, Fusulina Limestone, Province of Palermo, GEMMELLARO, Giorn. Sci. Palerm. xx, p. 96, fig.; †*M. vicariana, trepomena, loxonemoides, margarita, M. ? obesa*, Devonian of S. England, WHIDBORNE, Pal. Soc. pp. 314-319, figs. : n. spp.

†*Phanerotinus militaris, mundus*, n. spp., Devonian, S. of England, WHIDBORNE, Pal. Soc. pp. 259-261, figs.

†*Phanerotrema australis*, n. sp., Upper Silurian of Victoria, ETHERIDGE, Rec. Austral. Mus. i, p. 128, fig.

*Pleurotomaria adansoniana*, discovery of the largest example and second largest living representative of the genus in Tobago; GUPPY, P. Z. S. 1891, p. 484. [And in \*Tr. N. H. Soc. Trinidad, 1890. A fig. of this specimen of the natural size has been issued by R. Damon.].

†*P. bittneri*, St. Cassian Beds, KITTL, Ann. Hofmuseum Wien, vi, p. 200, fig.; †*P. champernowni, neapolitana, seminuda, subimbricata, shuleri, dissimulatrix, crokeri*, Devonian of S. England, WHIDBORNE, Pal. Soc. pp. 277-302, figs.; †*P. gonistoma*, Devonian of Manitoba, WHITEAVES, Tr. R. Soc. Canada, viii, Sect. 4, p. 99, fig.; †*P. murchisoniæformis, retroplicata, trinchessii, coheni, biondii, catherinæ, thyrræna, heterospira, mazarensis, salomonensis, isomorpha, psiche, mariani, josephinia, neumayri, piazzi*, Fusulina Limestone, Province of Palermo, GEMMELLARO, Giorn. Sci. Palerm. xx, pp. 97-111 : n. spp.

†*Plocostoma*, n. subg. of *Pleurotomaria*; GEMMELLARO, Giorn. Sci. Palerm. xx, p. 108, fig.

†*Ptychomphalus neumayri*, n. n. for *Turbo fasciolatus*, Laube; *P. ? palæopsis*, n. sp., St. Cassian Beds; KITTL, Ann. Hofmuseum Wien, vi, pp. 204 & 205, figs.

†*Raphistomella*, n. g., type *Pleurotomaria radians*, Wissmann, St. Cassian Beds; KITTL, Ann. Hofmuseum Wien, vi, p. 201, fig.

†*Schizodiscus*, n. g., type, *Pleurotomaria plana*, Klipst., St. Cassian Beds; KITTL, Ann. Hofmuseum Wien, vi, p. 211, fig.

#### SCISSURELLIDÆ.

Monograph: PILSBRY in TRYON'S Manual, xii, 1890, pp. 49-69, includes *Scissurella* and *Schisomope*.

†*Temnotropis costellata, transitoria*, Fusulina Limestone, Province of Palermo, GEMMELLARO, Giorn. Sci. Palerm. xx, pp. 94 & 95, figs.; †*T. fallax, suessi*, St. Cassian Beds, KITTL, Ann. Hofmuseum Wien, vi, p. 180, fig. : n. spp.

†*Trochotoma elegans, prisca*, n. spp., Fusulina Limestone, Province of Palermo, GEMMELLARO, Giorn. Sci. Palerm. xx, pp. 92 & 93, figs.

†*Worthenia furcata, coralliophila, bieberi, cassiana, rarissima, dregeri, toulai, subtilis, turriculata, duplicata*, n. spp., St. Cassian Beds, KITTL, Ann. Hofmuseum Wien, vi, pp. 187-199, figs.

↓ † *Zygites*, n. g., type *Pleurotomaria delphinula*, Laube; KITTL, Ann. Hofmuseum Wien, vi, p. 200, fig.

#### BELLEROPHONTIDÆ.

† *Bellerophon hicksii*, *imperfatus*, Devonian of S. England, WHIDBORNE, Pal. Soc. pp. 326–329, figs.; † *B. clausus*, *lamellosus*, *cristatus*, *daubenyi*, *cylindricus*, *savii*, *lyelli*, *sosiensis*, Fusulina Limestone, Province of Palermo, GEMMELLARO, Giorn. Sci. Palerm. xx, pp. 112–119, figs.; † *B. creswelli*, Upper Silurian of Victoria, ETHERIDGE, Rec. Austral. Mus. i, p. 130, fig. : n. spp.

† *Bucania warthi*, n. sp., Upper Palæozoic, Salt Range, India, WAAGEN, Pal. Ind. iv, p. 121, fig.

#### FISSURELLIDÆ.

Monograph: PILSBRY in TRYON's Manual, xii, 1890, pp. 141–290, divides into Subfam. I. *Fissurellinæ* : *Fissurella* (with 3 subg., 2 sections, and many groups). II. *Fissurellidinæ* : *Fissurellidea*, *Pupillæ*, *Lucapina*, *Megatebennus*, *Macrochisma*, *Lucapinella*. III. *Emarginulinæ* : *Glyphis*, *Puncturella* (in 3 sections), *Emarginula* (with 2 subgg.), *Subemarginula*, *Scutus*.

*Fissurella*, *Emarginula*, and *Rimula*, recent and Tertiary forms from the Mediterranean region; GREGORIO, Icon. conch. Medit. liv. ix.

*Emarginula magnifica*, p. 251, St. Croix, W. Indies, *souverbiana*, p. 262, Is. of Art, New Caledonia, *subclathrata*, p. 266, Sandwich Is., *nesta*, p. 269, Red Sea, n. spp., PILSBRY in TRYON's Manual, xii, 1890, figs.

*Fissurella punctatissima*, Chili, p. 150, *rubropicta*, p. 161, Lower California, n. spp., PILSBRY in TRYON's Manual, xii, 1890, figs.

*Glyphis crucifera*, n. sp. [= *Fissurella cruciata*, Krauss, non Gould], Natal; PILSBRY in TRYON's Manual, xii, 1890, p. 225, figs.

↓ *Lucapinella*, n. g., type *Olypidella callomarginata*, Cpr.; PILSBRY in TRYON's Manual, xii, 1890, p. 195.

↓ *Megatebennus*, n. g., type *Fissurellidea bimaculata*, Dall (with new section *Amblychilepus*; type *Fissurella trapezina*, Sow.); PILSBRY in TRYON's Manual, xii, 1890, p. 182.

*Parmophorus*: larval form; BOUTAN, C.R. cxiii, p. 92: mantle and shell; *id.* Rev. Biol. iii, p. 271, figs.

#### DOCOGLOSSA.

#### ACMÆIDÆ.

Monograph: PILSBRY in TRYON's Manual, xiii, pp. 1–66, includes Subfam. I. *Pectinodontinæ* : *Pectinodonta*. II. *Acmaeinæ* : *Acmaea* and *Scurria*.

*Acmaea candeana*, vs. *A. antillarum*; PILSBRY, Naut. v, p. 85.

*A. dalliana*, p. 13, Gulf of California, *carpenteri*, p. 39, West Indies,



*garrettii*, p. 47, Viti Is., *chathamensis*, p. 56, Chatham Is., n. spp., PILSBRY in TRYON'S Manual, xiii, figs.

†*Phenacolepas*, n. n. for *Scutellina*, Gray, 1847 (preoccupied for *Echinodermata*); PILSBRY, Naut. v, p. 88.

†*Scurria sturi*, n. sp., Cretaceous of Upper Bavaria, BOEHM, Palæontogr. xxxviii, p. 69, fig.

*Scutellinidæ*: Monograph; PILSBRY in TRYON'S Manual, xii, 1890, pp. 127-131. Single genus.

*Scutellina*, preocc., *Phenacolepas* [*q.v.*] proposed.

#### PATELLIDÆ.

Monograph: PILSBRY in TRYON'S Manual, xiii, pp. 76-164 (revised classification, p. 172), includes:—I. Subfam. *Patellinæ*: *Patella* and *Helcion*. II. Subfam. *Nacellinæ*: *Nacella*, *Helcioniscus*.

*Helcion gracile*, n. sp., English Channel, LOCARD, Ann. Soc. L. Lyon, xxxvii, p. 230.

*Helcioniscus stearnsii*, p. 132, Japan, *eucosmia*, p. 148, Suez, Japan, Australia, *melanostomus*, p. 151, hab.?, n. spp., PILSBRY in TRYON'S Manual, xiii, figs.

†*Palæacmæa lebescontei*, n. sp., Grès Armoricaïn of Brittany, BARROIS, Ann. Soc. Géol. Nord. xix, p. 215, fig.

*Patella boninensis*, Japan, PILSBRY, Naut. v, p. 79; *P. hypsilotera*, English Channel, LOCARD, Ann. Soc. L. Lyon, xxxvii, p. 226; *P. patriarcha*, Cape of Good Hope, PILSBRY in TRYON'S Manual, xiii, p. 105, fig.; *P. (Helcioniscus) stearnsii*, Japan, PILSBRY, Naut. iv, p. 100: n. spp.

*P. scutellina*, n. n. [= *P. scutellaris*, Loc., non Lamk.]; LOCARD, Ann. Soc. L. Lyon, xxxvii, p. 229.

#### LEPETIDÆ.

Monograph: PILSBRY in TRYON'S Manual, xiii, pp. 66-76, includes Subfam. I. *Lepetinaæ*: *Lepeta* (with 2 sect. and subgen. *Pilidium*), *Pro-pilidium*. II. *Lepetellinaæ*: *Lepetella*.

#### TITISCANIIDÆ.

Monograph: PILSBRY in TRYON'S Manual, xiii, pp. 164 & 165.

#### INCERTÆ SEDIS.

*Robillardia*, Note on; FISCHER, J. de Conch. xxxi, pp. 6-8.

†*Turbinilopsis planorbiformis*, n. sp., Fusulina Limestone, Province of Palermo, GEMMELLARO, Giorn. Sci. Palerm. xx, p. 86, fig.

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## IV. POLYPLACOPHORA.

## CHITONIDÆ.

Structure of the integument; BLUMRICH, Z. wiss. Zool. lii, pp. 404-476, figs.

*Chiton* (*Ischnochiton*) *yerburyi*, *C. (Callistochiton) adenensis*, n. spp., Aden, SMITH, P. Z. S. 1891, pp. 420 & 421, fig.

## V. APLACOPHORA.

## NEOMENIIDÆ.

Anatomy of nine species belonging to the genera *Dondersia*, *Ismenia*, *Proneomenia*, and *Paramedia*.

*Dondersia banyulensis*, p. 715, *flavens*, p. 718, n. spp., Banyuls; PRUVOT, Arch. Z. expér. ix, figs.

† *Ismenia*, n. g., *I. ichthyodes*, n. sp., Banyuls, PRUVOT, Arch. Z. expér. ix, p. 719, fig.

† *Paramenia*, n. g., with *P. impexa*, *sierra*, *palifera*, n. spp., Banyuls, PRUVOT, Arch. Z. expér. ix, pp. 724-727, figs.

*Proneomenia sopita*, n. sp., Banyuls, PRUVOT, Arch. Z. expér. p. 721, fig.

## VI. SCAPHOPODA.

† *Cadulus nutans*, n. sp., Cretaceous of Upper Bavaria, BOEHM, Palæontogr. xxxviii, p. 70, fig.

*Dentalium*: discovery of the heart; PLATE, Zool. Anz. 1891, p. 78.

*D. senegalense*, Senegal, DAUTZENBERG, Mém. Soc. Zool. iv, p. 53, fig.;

† *D. tenuicostatum*, Cretaceous of Upper Bavaria, BOEHM, Palæontogr. xxxviii, p. 69, fig. : n. spp.

† *Spirodentalium*, n. g., type *S. osceola*, n. sp., Cambrian of Wisconsin; WALCOTT, P. U. S. Nat. Mus. xiii, p. 271, fig.

## VII. PELECYPODA.

Anatomy of typical forms, comparative anatomy, and classification based on the gill structure; PELSENEER, Arch. Biol. xi, pp. 147-322, figs. (Preliminary communication, Bull. Sci. Fr. Belg. (3) ii (1889) pp. 27-52).—Anatomy and circulation, with classification; MÉNÉGAUX (279).—Classification according to hinge characters; full text so far as completed of the scheme propounded in 1883 [cf. Zool. Rec. 1883, *Moll.* pp. 86 & 87]; NEUMAYR, Denk. Ak. Wien. lviii, pp. 701-801.

Mechanical origin of structure in *Pelecypods*; JACKSON, Am. Nat. xxv, p. 11.

*Septibranchiata* and *Eulamellibranchiata Anatinacea* are hermaphrodite with distinct male and female glands; PELSENEER, Zool. Anz. 1891, p. 5.

Bulbus arteriosus and valves of the aorta ; GROBBEN, Arb. z. Inst. Wien, ix, 16 pp., 1 pl.

Histology of the blood ; GRIESBACH, Arch. mikr. Anat. xxxvii, pp. 22-98, figs.

Turgescence of various parts ; MÉNÉGAUX, C.R. Ass. Fr. Sci. 1890, ii, p. 527.

Renal function ; LETELLIER, C.R. Acad. Paris, cxii, p. 56.

## TETRABRANCHIA.

### OSTRACEA.

#### OSTREIDÆ.

†*Exogyra ptychodes*, *subplicifera*, Upper Jurassic of Mexico, FELIX, Palæontogr. xxxvii, pp. 176 & 177, figs. ; †*E. griepenkerli*, Cretaceous of Upper Bavaria, BOEHM, *op. cit.* xxxviii, p. 90, fig. : n. spp.

†*Gryphæa mexicana*, n. sp., Upper Jurassic of Mexico, FELIX, Palæontogr. xxxvii, p. 178, fig.

†*Nayadina gaudryi*, n. sp., Cretaceous of Tunis, PERON, Explor. Scient. Tunisie, p. 200, fig.

*Ostrea*, anatomy of ; MÉNÉGAUX, (279) pp. 104-122, figs. *O. cristigalli*, *nigro-marginata*, *mordux*, *cornucopiæ*, *glomerata*, economically considered, with full description and embryology of the last named ; SAVILLE-KENT (214A). [See also *ante*, under "Economics."]

†*O. chili*, Tertiary, Grand Canary, ROTHPLETZ & SIMONELLI, Z. geol. Ges. xlii, p. 699, fig. ; †*O. dieneri*, *directa*, Cretaceous, Syria, BLANCKENHORN, (21) pp. 72 & 73, figs. ; †*O. oudrii*, *gauthieri*, *vatonnei*, *pupieri*, *heinzi*, *bleicheri*, *tissoti*, *bretoni*, n. spp., Cretaceous of Tunis, PERON, Explor. Scient. Tunisie, pp. 188-197, figs. ; †*O. rollandi* [n. sp.?], Cretaceous, Algerian Sahara, BOQUAND in ROLLAND, Géol. du Sahara Algérien, &c., p. 48, fig. ; †*O. semidentata*, *subuncinella*, Cretaceous of Upper Bavaria, BOEHM, Palæontogr. xxxviii, pp. 91-93, figs. ; †*O. trigonioides*, *tournoneri*, *asciiformis*, *bachmanni*, *argoviana*, *carryensis*, *descartesi*, *fontanesi*, *bourgueti*, *serravallensis*, *spatuliformis*, *helvetica*, Molasse of Switzerland, MAYER-EYMAR, Viert. Ges. Zürich, xxxvi, pp. 387-392 : n. spp.

#### ANOMIIDÆ.

*Anomia*, anatomy of ; PELSENEER, Arch. Biol. xi, pp. 184-187, fig.

*A. boletiformis*, French Coasts, LOCARD, Ann. Soc. L. Lyon, xxxvii, p. 360 ; †*A. (P.) koeneni*, Tithonian of Rodeoviejo, Argentine Republic, BEHRENDSEN, Z. geol. Ges. xliii, p. 417, fig. : n. spp.

### PECTINACEA.

#### DIMYIDÆ.

†*Dimya subrotunda*, n. sp., Neocomian of Mexico, FELIX, Palæontogr. xxxvii, p. 163, fig.

## SPONDYLIDÆ.

†*Plicatula locardi*, n. sp., Cretaceous of Tunis, PERON, Explor. Scient. Tunisie, p. 212, fig.

## LIMIDÆ.

*Lima*, anatomy of ; PELSENEER, Arch. Biol. xi, p. 201, fig.

*L. murrayi*, *australis*, Challenger Station 164 B, off Sydney, SMITH, P. Z. S. 1891, p. 444, figs ; †*L. comatulicosta*, Upper Jurassic of Mexico, FELIX, Palæontogr. xxxvii, p. 178, fig. ; †*L. numidica*, *oblique-costata*, *L. (?) sulcato-crenulata*, *L. subsimplex*, *bleicheri*, Cretaceous of Tunis, PERON, Exped. Scient. Tunisie, pp. 217-220, fig. ; †*L. tenuitesta*, Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 390, figs. ; †*L. (Plagiostoma) mysica*, (*Radula*) *baliana*, Trias of Asia Minor, BITTNER, JB. geol. Reichsanst. xli, p. 109, figs. : n. spp.

## PECTINIDÆ.

*Aviculopecten* placed with *Aviculidæ* [q.v.] by FRECH (135).

†*Ohlmys sulcato-costatus*, n. sp., Cretaceous of Tunis, PERON, Exped. Scient. Tunisie, p. 234, fig.

†*Hinnites scephidicus*, n. sp., Trias of Asia Minor, BITTNER, JB. geol. Reichsanst. xli, p. 110, fig.

†*Leptochondria*, n. subg. of *Pecten* ; type, *P. æolicus*, n. sp., BITTNER, JB. geol. Reichsanst. xli, p. 101.

*Pecten* : anatomy of ; PELSENEER, Arch. Biol. xi, p. 200, fig. ; MÉNÉGAUX, (279) pp. 90-102, figs. *P. opercularis* : size of the eyes increases with the diameter of the animal, but their number varies ; BRINDLEY, P. Camb. Phil. Soc. vii, p. 97.

†*P. bodenbenderi*, Lias of Portezuelo, Argentine Republic, BEHRENDSEN, Z. geol. Ges. xliii, p. 391, fig. ; *P. challengerii*, Challenger Station 164 B, off Sydney, SMITH, P. Z. S. 1891, p. 443, fig. ; †*P. crispulus*, Cretaceous of Upper Bavaria, BOEHM, Palæontogr. xxxviii, p. 87, fig. ; *P. meridionalis*, Tasmania, TATE, P. R. Soc. Tasm. 1886 (1887) p. 115 ; †*P. mysicus*, Trias of Asia Minor, BITTNER, JB. geol. Reichsanst. xli, p. 110, fig. ; †*P. ortianensis*, *meneghinianus*, Lias of Longobucco, FUCINI, Bull. Soc. Mal. Ital. xvi, pp. 47 & 48, figs. ; †*P. roemeri*, Cretaceous of Texas, HILL (185) ; †*P. (Leptochondria) æolicus*, Trias of Asia Minor, BITTNER, JB. geol. Reichsanst. xli, p. 101, fig. ; †*P. (Pleurnectites) devonicus*, Devonian of Germany, FRECH, Abh. Geol. specialkarte Preuss. ix, Hft. 3, p. 13, fig. : n. spp.

†*Vola subatava*, n. sp., Cretaceous of Syria, BLANCKENHORN, (21) p. 78, fig.

## MYTILACEA.

## AVICULIDÆ.

*Aviculidæ* from the Devonian of Germany, with classification and tables of distribution, and philogenetic relationships. The family is divided into

I. *Aviculopectininae*; II. *Aviculinae*; III. *Kochiinae*; IV. *Pterineaenae*; V. *Ambonychiaenae*; VI. *Myalininae*; FRECH, Abh. Geol. specialkarte Preuss. ix, Hft. 3, 261 pp., figs.

*Malleacea*: monograph by Küster & Clessin in MARTINI & CHEMNITZ, viii, Abth. i.

†*Actinodesma annæ*, n. sp., Devonian of Germany, FRECH, Abh. Geol. specialkarte Preuss. ix, Hft. 3, p. 106, fig..

†*Ambonychia* ? *poststriata*, n. sp., Upper Silurian of Victoria, ETHERIDGE, Rec. Austral. Mus. i, p. 126, fig.

*Avicula*: anatomy of; PELENEER, Arch. Biol. xi, pp. 197 & 198, fig.; MÉNÉGAUX, (279) pp. 21-43, fig.

†*Avicula justii, trevirana, rigomagensis, dilbensis, æmiliana, marie, winteri, eberti, languedociana, schencki* (*Pteronites*) *belgica*, Devonian of Germany, FRECH, Abh. Geol. specialkarte Preuss. ix, Hft. 3, pp. 36-61, figs.; †*A.* (? *Meleagrina*) *foulloni*, Trias of Asia Minor, BITTNER, JB. geol. Reichsanst. xli, p. 111, fig.: n. spp.

†*Aviculopecten pelmensis, aquisgranensis, prumiensis, schulzi*, (*Pterinopecten*) *eifeliensis, calceolæ, mosellanus, wulfi*, (*Orbipecten*) *follmanni*, n. spp., Devonian of Germany, FRECH, Abh. Geol. specialkarte Preuss. ix, Hft. 3, pp. 15-29, figs.

†*Byssopteria* (?) *sempiiana*, n. sp., Devonian of Germany, FRECH, Abh. Geol. specialkarte Preuss. ix, Hft. 3, p. 133, fig.

†*Cassianella angusta*, n. sp., Trias of Asia Minor, BITTNER, JB. geol. Reichsanst. xli, p. 112, fig.

*Crenatula reveana*, n. sp., Red Sea, CLESSIN in MARTINI & CHEMNITZ, viii, Abth. i, p. 50, fig.

†*Cyrtodonta declivis, orbicularis*, Devonian of Germany, FRECH, Abh. Geol. specialkarte Preuss. ix, Hft. 3, pp. 131 & 132, figs.; †*C. lata*, Grès Armoricaïn of Brittany, BARROIS, Ann. Soc. Géol. Nord. xix, p. 205, fig.: n. spp.

†*Cyrtodontopsis*, n. subg. of *Gosseletia*, FRECH, Abh. Geol. specialkarte Preuss. ix, Hft. 3, p. 125.

†*Gervillia obsesa, G. perobesa, G. trapezoidalis*, n. spp., Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, pp. 391 & 392, figs.

†*Gosseletia microdon, pseudalectryonia, schizodon, G. (?) minor, G. angulosa*, (*Cyrtodontopsis*) *quarzitica, præcursor, halfari*, n. spp., Devonian of Germany, FRECH, Abh. Geol. specialkarte Preuss. ix, Hft. 3, pp. 111-129, figs.

†*Halobia neumayri*, n. sp., Trias, Asia Minor, BITTNER, JB. geol. Reichsanst. xli, p. 99, fig.

†*Inoceramus montezumæ*, n. sp., Cretaceous of Mexico, FELIX, Palæontogr. xxxvii, p. 181.

†*Kochia*, n. n. for *Rœmeria*, Koch, and *Onychia*, Sandb.; type, *Kochia capuliformis*, Koch, with *Loxopteria*, n. subg., *K. lavis, rugosa*, n. spp., Devonian of Germany, FRECH, Abh. Geol. specialkarte Preuss. ix, Hft. 3, pp. 72-78, figs.

†*Leiopteria cuyahoga*, n. sp., Waverly Beds of Ohio, HERRICK, Bull. Geol. Soc. Am. ii, p. 44.

†*Limoptera semiradiata, rhenana*, n. spp., Devonian of Germany, FRECH, Abh. Geol. specialkarte Preuss. ix, Hft. 3, pp. 65–67, figs.

†*Loxopteria*, n. subg. of *Kochia* [q.v.]; FRECH, Abh. Geol. specialkarte Preuss. ix, Hft. 3, p. 75.

*Malleus acutus*, n. sp., hab. ?, KOBELT in MARTINI & CHEMNITZ, viii, Abth. i, p. 13, fig.

*Meleagrina*: anatomy of; PELSENER, Arch. Biol. xi, pp. 198 & 199; MÉNÉGAUX, (279) pp. 43 & 44. *M. margaritifera*, experimental cultivation, habits, &c.; KENT, Rep. Austral. Ass. ii, p. 541.

†*M. schlosseri*, n. sp., Cretaceous of Upper Bavaria, BOEHM, Palæontogr. xxxviii, p. 82, fig.

†*Myalina circularis, justi, kochi, rhenana, beushauseni, beyrichi, klockmanni, villmarensis, calceolæ, lodanensis*, n. spp., Devonian of Germany, FRECH, Abh. Geol. specialkarte Preuss. ix, Hft. 3, pp. 141–158, figs.

†*Myalinoptera*, n. g., type *Avicula crinita*, Roemer, with *M. alpina*, n. sp., Devonian of Germany; FRECH, Abh. Geol. specialkarte Preuss. ix, Hft. 3, pp. 137–139, figs.

†*Pergamidia*, n. g., type, *P. eumenea, attalea*, n. spp., Trias of Asia Minor; BITTNER, JB. geol. Reichsanst. xli, p. 103, fig.

*Perna lamarchiana*, p. 32, hab. ?, *novohollandia*, p. 34, Australia, *aquila, rollei, flava, obliqua, planulata*, pp. 43–45, hab. ?, KÜSTER & CLESSIN in MARTINI & CHEMNITZ, viii, Abth. i, figs.; †*P. palestina*, Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 394, fig.; †*P. cirrata*, Cretaceous of Syria, BLANCKENHORN, (21) p. 80, fig.: n. spp.

*Pinna*: anatomy of; PELSENER, Arch. Biol. xi, p. 199; MÉNÉGAUX, (279) pp. 48–57, fig.

*P. lischkeana*, p. 73, Japan, *rollei*, p. 77, hab. ?, *molluccensis*, p. 82, Molluccas, *atrata*, p. 83, hab. ?, n. spp., CLESSIN in MARTINI & CHEMNITZ, viii, Abth. i, figs.

†*Posidonomya cretacea*, Cretaceous of Mexico, FELIX, Palæontogr. xxxvii, p. 180, fig.; †*P. ? pergamena*, Trias of Asia Minor, BITTNER, JB. geol. Reichsanst. xli, pp. 104 & 112, fig.: n. spp.

†*Pseudomonotis subradialis*, n. sp., Upper Palæozoic, Salt Range, India, WAAGEN, Pal. Ind. iv, p. 129, fig.

†*Pterinaea subcostata, byssifera, lodanensis, follmanni, ostreiiformis*, n. spp., Devonian of Germany, FRECH, Abh. Geol. specialkarte Preuss. ix, Hft. 3, pp. 87–98, figs.

†*Pterinoperna syriaca*, n. sp., Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 393, figs.

†*Ptychopteria æquivalvis*, n. sp., Devonian of the Mackenzie River Basin, WHITEAVES, Geol. Surv. Canada, Contrib. to Canadian Palæont. i, p. 239, fig.

*Vulsella*: anatomy of; MÉNÉGAUX, (279) pp. 44–48, figs.

†*Vulsella* from the Nummulitic Beds of Egypt. *V. chamiformis*, p. 59,

*latilamella*, p. 63, *macrocephala*, p. 63, *virgula*, p. 63, *zitteli*, p. 64, MAYER-EYMAR, Viert. Ges. Zurich, xxxvi, pp. 58-64, n. spp.

†*Myssidia*, n. g., intermediate between *Aviculidæ* and *Mytilidæ*, type *M. orientalis*, n. sp., Trias of Asia Minor, BITTNER, JB. geol. Reichsanst. xli, p. 113, fig.

### MYTILIDÆ.

Monograph by KÜSTER & CLESSIN in MARTINI & CHEMNITZ, viii, Abth. 3.

*Dreysensia* and *Congerina*, their relationship and distribution in time and place. †*Tichogonia* (*Congerina*) *euchroma*, n. sp., p. 954, fig., Tertiary of Vicentini, OPPENHEIM, Z. geol. Ges. xliii, pp. 923-966, 1 pl.

*Lithodomus*: anatomy of; MÉNÉGAUX, (279) pp. 58-63, figs.

*Dreissensia*: development; WELTNER, Zool. Anz. xiv, p. 447. *D. polymorpha*: development; KORSCHULT, SB. nat. Fr. 1891, p. 131. *D.* larva free-swimming, in freshwater; BOCHMANN, Biol. Centralbl. xi, p. 476.

*Lithodomus moravicus*, nom. nud.; RŽEHAK, Verh. Ver. Brünn. xxix, p. 34.

*Modiola gigantea*, p. 134, Norwegian Coast, *angasi*, p. 136, Australia, *ovata*, p. 137, hab. ?, *angusta*, p. 160, hab. ?, CLESSIN in MARTINI & CHEMNITZ, viii, Abth. 3, figs.; *M. sirahensis*, Aden, JOUSSEAUME, Le Nat. 1891, p. 222; †*M. roquei*, *flichei*, Cretaceous of Tunis, PERON, Exped. Scient. Tunisie, pp. 247 & 248, figs.: n. spp.

*Modiolaria*, anatomy of; PELSENEER, Arch. Biol. xi, pp. 196 & 197, fig.

†*Myalina* placed with *Aviculidæ* [q.v.] by FRECH (135).

†*Mytili* from the Nummulitic Beds of Egypt, with *M. fontinalis*, p. 169, *mariettei*, p. 170, *mutilus*, p. 170, *niloticus*, p. 171, *cossmanni*, p. 171, *procerulus*, p. 172, *resurrectus*, p. 172, MAYER-EYMAR, Viert. Ges. Zürich, xxxvi, pp. 169-175; †*M. charmesi*, Cretaceous of Tunis, PERON, Exped. Scient. Tunisie, p. 250, fig.: n. spp.

### ARCACEA.

#### ARCIDÆ.

*Arcidæ* of Roussillon; BUCQUOY, DAUTZENBERG, & DOLLFUS, ii, fasc. 5.

*Arca*, monograph by KOBELT in MARTINI & CHEMNITZ, viii, Abth. 2. Anatomy of *Arca*; PELSENEER, Arch. Biol. xi, pp. 188 & 189, fig.; MÉNÉGAUX, (279) pp. 72-78, figs.: description of heart, which is single; FRANÇOIS, Arch. Z. expér. ix, pp. 229-231, fig.

*A. dunkeri* [= *A. setigera*, Dunk., non Reeve], Loanda, KOBELT in MARTINI & CHEMNITZ, viii, Abth. 2, p. 162; †*A. cardioides*, Cretaceous of Upper Bavaria, BOEHM, Palæontogr. xxxviii, p. 80, fig.: n. spp.

†*Barbatia glyphus*, n. sp., Cretaceous of Upper Bavaria, BOEHM, Palæontogr. xxxviii, p. 79, fig.

*Limopsis vaginatus*, n. sp., Behring Sea, DALL, P. U. S. Nat. Mus. xiv, p. 190.

† *Parallelodon antiquus*, n. sp., Grès Armoricaïn of Brittany, BARROIS, Ann. Soc. Géol. Nord. xix, p. 200, fig.

*Pectunculus*, anatomy of; PELSENEER, Arch. Biol. xi, p. 189, fig.; MÉNÉGAUX, (279) pp. 78–89, figs.

*P. sordidus*, n. sp., S. Austr., TATE, Tr. R. Soc. S. Austr. xiv, p. 264, fig.

† *Redonia boblayei*, n. sp., Grès Armoricaïn of Brittany, BARROIS, Ann. Soc. Géol. Nord. xix, p. 183, fig.

† *Savignyarcæ*, n. g. with *S. savignyarcæ*, n. sp., Aden; JOUSSEAUME, Le Nat. 1891, p. 222.

† *Trigonarca palestina*, n. sp., Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 395, fig.

### NUCULIDÆ.

The Otocysts throughout life communicate freely with the exterior; PELSENEER, Zool. Jahrb. iv, Anat. pp. 501–504.

*Nuculidæ* of Roussillon; BUCQUOY, DAUTZEBERG, & DOLLFUSS, ii, fasc. 5.

† *Actinodonta obliqua*, *carinata*, *acuta*, n. spp., Grès Armoricaïn of Brittany, BARROIS, Ann. Soc. Géol. Nord. xix, pp. 169–175, figs.

† *Ctenodonta oehlerti*, n. sp., Grès Armoricaïn of Brittany, BARROIS, Ann. Soc. Géol. Nord. xix, p. 184, fig.

† *Ditichia*, n. g., type *Leda mira*, Beush., Lower Devonian; SANDBERGER, JB. Mineral. 1891, ii, p. 104.

*Leda*, anatomy of; PELSENEER, Arch. Biol. xi, pp. 168–175, fig.

† *L. scutula*, *zitteli*, *semipolita*, *siegsdorfensis*, Cretaceous of Upper Bavaria, BOEHM, Palæontogr. xxxviii, pp. 76–78, figs.; *L. verconis*, S. Australia, TATE, Tr. R. Soc. S. Austr. xiv, p. 264, fig. : n. spp.

*Nucula*, anatomy of; PELSENEER, Arch. Biol. xi, pp. 153–168, fig.; MÉNÉGAUX, (279) pp. 68–71, fig.; *N. dilecta*, *umbonata*, Challenger Station 164 B, off Sydney, SMITH, P. Z. S. 1891, pp. 442 & 443, figs.; † *N. glanstriticea*, Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 396, fig.; † *N. subredempta*, *lucida*, Cretaceous of Upper Bavaria, BOEHM, Palæontogr. xxxviii, pp. 75 & 76, fig. : n. spp.

† *Nuculana lebescontei*, *incola*, n. spp., Grès Armoricaïn of Brittany, BARROIS, Ann. Soc. Géol. Nord. xix, pp. 195–197, figs.

† *Nuculites acuminata*, *torta*, n. spp., Grès Armoricaïn of Brittany, BARROIS, Ann. Soc. Géol. Nord. xix, pp. 192–194, figs.

### SUBMYTILACEA.

#### MODIOLOPSIDÆ.

*Cyrtodonta* placed with *Aviculidæ* [q.v.] by FRECH (135).

† *Hippomya salteri*, n. sp., Grès Armoricaïn of Brittany, BARROIS, Ann. Soc. Géol. Nord. xix, p. 210, fig.



† *Modiolopsis davyi*, n. sp., Grès Armoricaïn of Brittany, BARROIS, Ann. Soc. Géol. Nord. xix, p. 208, fig.

† *Modiomorpha attenuata*, n. sp., Devonian of Manitoba, WHITEAVES, Tr. R. Soc. Canada, viii, sect. 4, p. 96, fig.

† *Myophoria micrasiatica*, n. sp., Trias of Asia Minor, BITTNER, JB. geol. Reichsanst. xli, p. 114, fig.

*Trigonia*: anatomy; PELSENER, Arch. Biol. xi, pp. 190-196, fig.; MÉNÉGAUX, (279) pp. 65-67, fig.

† *T. pocilliformis*, *kikuchiana*, *rotundata*, Cretaceous of Japan, YOKOYAMA, J. Coll. Sci. Japan, iv, pp. 361-365, figs.; † *T. pseudo-caudata*, Cretaceous of Tunis, PERON, Exped. Scient. Tunisie, p. 261, fig.; † *T. regularicostata*, *undulatocostata*, *lewisi*, BLANCKENHORN, (21) pp. 82 & 83, figs.; † *T. sologureni*, Upper Jurassic of Mexico, FELIX, Palæontogr. xxxvii, p. 179, fig. : n. spp.

### UNIONIDÆ.

Probable antiquity; AMALITZKI, C.R. Sect. Biol. Soc. Varsovie, ii, No. 7, p. 1.

South African *Unionidæ*; SMITH, Ann. N. H. viii, p. 317.

Notes on *Unionidæ*; SIMPSON, Naut. v, p. 86.

Notes on specimens from E. Texas; PILSBRY, Naut. v, p. 74.

Species belonging to, or originally described from, the Central Southern States of the U.S.A. found in S. Florida; WRIGHT, Naut. iv, p. 125.

Means of distribution in S. E. United States; SIMPSON, Naut. v, p. 15.

Notes, principally on the glochidia of *Anodon* and *Unio*; LATTEP, P. Z. S. 1891, pp. 52-59, fig.

*Anodonta*, Observations on; JHERING, Zool. Anz. xiv, p. 474. *A. corpulenta*, Cooper, destruction of; STRODE, Naut. v, p. 89. *A. piscinalis*, embryonal development; GOETTE, Z. wiss. Zool. lii, pp. 158-168, figs.

*A. ataxiaca*, n. sp. [?], Jouanes (Aude), BAICHÈRE, Bull. Soc. Mal. Fr. vii, p. 129; *A. culoxiana* [= *A. cygnea*], Riv. Rhone, NICOLAS, Mém. Ac. Vacluse, ix, pp. 139-150, 2 pls.; *A. suevica*, Riv. Neckar, near Grötzingen, *borealis*, Riv. Ocha (Russia), KOBELT in ROSSMAESSLER's Iconographie, iv (1889-91) p. 99, figs. : n. spp.

✓ *Castalina*, n. g., with *C. nehringi* and *martensi*, n. spp., Brazil; JHERING, Zool. Anz. xiv, pp. 477 & 478.

✓ *Chambardia*, n. g. for the Egyptian *Iridinidæ*, with *C. letourneuxi*, *rhynchoidea*, *locardiana*, *pharaonum*, *bourguignati* ("Letourneux in litt.")!, n. spp., Egypt; BOURGUIGNAT in SERVAIN, Bull. Soc. Mal. Fr. vii, pp. 304-313, figs.

✓ *Gabillotia*, n. g., type *Anodonta pseudodopsis*, Locard, with *G. locardi*, n. sp., Lake of Antioch, Syria; SERVAIN, Bull. Soc. Mal. Fr. vii, p. 296, fig.

*Glabaris*, Observations on; JHERING, Zool. Anz. xiv, p. 474.

*Unio*: Byssus in young of *U. ligamentinus*; Naut. v, pp. 73 & 90.. *U. radiatus* and *U. luteolus* distinguished; DEAN, Naut. v, p. 77.

*U. bramicus*, n. sp. [?], Bram (Aude), BAICHÈRE, Bull. Soc. Mal. Fr. vii, p. 125; *U. landanensis*, Congo, SCHEPMAN, Notes Leyd. Mus. xiii, p. 113, fig.; *U. paviei, molleuri*, Laos, MORLET, J. de Conch. xxxi, pp. 241 & 242, figs.; *U. pilsbryi, pleasii*, Little Red Riv., Arkansas, MARSH, Naut. v, p. 1; *U. singleyanus, ferriassii*, near Pilatka, Florida, *id. t. c.* pp. 29 & 30; *U. semmelinki*, Borneo, MARTENS, SB. nat. Fr. 1891, p. 111; †*U. szegedensis*, Lower Tertiary of Szegedin., HALAVÁT, Magyar Föld. int. Évkön, ix, p. 90, fig.; *U. (Arconaia) provancheriana*, R. Yamaska, Canada, PILSBRY, Nat. Canad. xx, p. 171, also in Naut. iv, p. 127, with hab. "China?" : n. spp.

## CARDINIIDÆ.

†*Cardinia antelonga*, n. sp., Lias of Longobucco, FUCINI, Bull. Soc. Mal. Ital. xvi, p. 53, fig.

## CARDITIDÆ.

†*Calyptogena*, n. g., with *C. pacifica*, n. sp., Alaska, DALL, P. U. S. Nat. Mus. xiv, pp. 189 & 190.

*Cardita* : anatomy of; PELSENEER, Arch. Biol. xi, p. 202, fig.; MÉNÉGAUX, (279) pp. 152 & 153.

*C. formulosa*, Mediterranean, LOCARD, Ann. Soc. L. Lyon, xxxvii, p. 310; †*C. georginae*, Lias of Longobucco, FUCINI, Bull. Soc. Mal. Ital. xvi, p. 54, fig.; †*C. sequenzae, de-blasii*, Oligocene of Sicily, CIOFALO, Atti Acc. Gioen. ii, pp. 85 & 86, fig.; †*C. senarti, doumeti*, Cretaceous of Tunis, PERON, Exped. Scient. Tunisie, pp. 266 & 267, figs.; †*C. rawsoni*, Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 397, fig. : n. spp.

*Venericardia barbarensis*, n. sp., California, STEARNS, P. U. S. Nat. Mus. xiii, p. 214, fig.

## ASTARTIDÆ.

†*Astarte matheyi, blauenensis, aglaia, valfinensis, quehenensis, clymene, diminutiva, daphne, burensis*, Lower Corallian of the Bernois Jura, LORIOI, Abh. Schw. pal. Ges. xviii, pp. 232-245, figs.; †*A. microphyes*, Upper Jurassic of Mexico, FELIX, Palæontogr. xxxvii, p. 179, fig.; †*A. præcipes, promissa*, Senonian of Friuli, TOMMASI, Atti Ist. Venet. (7) ii, pp. 1105 & 1106, figs.; †*A. subnana, subsimilis*, Cretaceous of Upper Bavaria, BOEHM, Palæontogr. xxxviii, pp. 73 & 74, figs.; †*A. subnumismalis, sequenzae*, Cretaceous of Tunis, PERON, Exped. Scient. Tunisie, pp. 268 & 269, figs.; †*A. strambergensis, æquilatera*, Tithonian of Argentine Republic, BEHRENDSEN, Z. geol. Ges. xliii, pp. 414 & 415, fig. : n. spp.

↓ †*Astartopsis*, n. g., allied to *Astarte*; *A. elongata, etalloni*, n. spp., Lower Corallian of the Bernois Jura; LORIOI, Abh. Schw. pal. Ges. xviii, pp. 218-220, figs.

†*Eriphyla cranulicosta*, n. sp., Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 403, fig.

†*Opis kobyi*, *quadrata*, *greppini*, *blauenensis*, Lower Corallian of the Bernois Jura, LORIOU, Abh. Schw. pal. Ges. xviii, pp. 247-257, fig. ; †*O. megambona*, Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 398 : n. spp.

- †*Platopsis*, n. g., type *P. [Opis] undata*, Conr., with *P. plicata*, *P. ? triangularis*, n. spp., Cretaceous of Syria ; WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, pp. 400 & 401, fig.

## CRASSATELLIDÆ.

*Crassatella carnea*, n. sp., S. Australia, TATE, Tr. R. Soc. S. Austr. xiv, p. 263, fig.

†*Scambula secunda*, n. sp., Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 402, fig.

## ERYCINACEA.

## ERYCINIDÆ.

*Lepton squamosum*, Mont., a commensal in the burrows of *Gebia stellata* ; NORMAN, Ann. N. H. vii, p. 276.

*Montacuta*, anatomy of ; PELSENEER, Arch. Biol. xi, pp. 203 & 204, fig.

*M. ferruginosa*, the habitat of ; MARSHALL, Journ. Conch. vi, p. 399.

*Tellima subacuminata*, n. sp., Challenger Station 164 B, off Sydney, SMITH, P. Z. S. 1891, p. 442, fig.

## CARDIACEA.

## TRIDACNIDÆ.

*Tridacna*, anatomy of ; MÉNÉGAUX, (279) pp. 130-134.

*Hippopus*, anatomy of ; PELSENEER, Arch. Biol. xi, p. 205, fig.

## CARDIIDÆ.

*Cardium*, anatomy of ; MÉNÉGAUX, (279) pp. 135-142, figs.

*C. bullatum*, French Coasts, LOCARD, Ann. Soc. L. Lyon, xxxvii, p. 303 ; †*C. cymotomon*, Neocomian of Mexico, FELIX, Palæontogr. xxxvii, p. 168, fig. ; †*C. incertum*, *subproductum*, *elongatum*, Cretaceous of Tunis, PERON, Exped. Scient. Tunisie, pp. 273-275, figs. ; †*C. præpapillosum*, Pliocene of Altavilla, GREGORIO, Nat. Sicil. xi, p. 59 ; †*C. ursicinum*, Lower Corallian of the Bernois Jura, LORIOU, Abh. Schw. pal. Ges. xviii, p. 187, figs. ; †*C. vincenti*, Oligocene of Etampes, COSSMANN, J. de Conch. xxxi, p. 283, fig. ; †*C. (Serripes ?) bewertense*, *C. (Protocardium ?) birdanum*, Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, pp. 404 & 405 : n. spp.

## CHAMACEA.

## CHAMIDÆ.

† *Apricardia douvillei*, n. sp., Cretaceous of Tunis, PERON, Exped. Scient. Tunisie, p. 278, fig.

*Chama*, anatomy of; MÈNÉGAUX, (279) pp. 125–129, figs.

† *Diceras*, and its relation to *Megalodon* and *Pachyerisma* discussed; BOEHM, Ber. Ges. Freiburg, vi, pp. 33–56, figs.

† *D. nöllingi*, Cretaceous of Syria, BLANCKENHORN, (21) p. 85; † *D. ? kobyi*, Lower Corallian of the Bernois Jura, LORIOL, Abh. Schw. pal. Ges. xviii, p. 227, fig. : n. spp.

## MONOPLEURIDÆ.

† *Monopleura tulae, otomitli, votuni*, n. spp., Neocomian of Mexico, FELIX, Palæontogr. xxxvii, pp. 164–166, figs.

† *Anodontopleura*, n. g., allied to *Monopleura*, for *A. speciosa*, n. sp., Neocomian of Mexico, FELIX, Palæontogr. xxxvii, p. 167, fig.

## HIPPURITIDÆ.

† *Hippurites*: TOUCAS revises the Sénonian species and gives table of geological distribution; Bull. Soc. Géol. xix, p. 527, figs. *H.*: revision of the principal species; DOUVILLÉ, Mém. Soc. Géol. No. 6.

† *H. corbaricus*, p. 9, *petrocoriensis*, p. 15, *inferus*, p. 23, *gosaviensis*, p. 21, Cretaceous of France, DOUVILLÉ, Mém. Soc. Géol. No. 6;

† *H. cedrorum*, Cretaceous of Syria, BLANCKENHORN, (21) p. 86 : n. spp.

## RADIOLITIDÆ.

*Radiolites*: 4 species from the Upper Chalk of the Northern borders of the Harz enumerated, and their relationships discussed; MUELLER, JB. k. preuss. geol. Landesanst. 1889 (1892) pp. 137–148.

† *R. choffati*, n. sp., Cretaceous of Tunis, PERON, Exped. Scient. Tunisie, p. 290, fig.

† *Sauvagesia*: internal characters; DOUVILLÉ, Bull. Soc. Géol. xix, p. 669, figs.

## CONCHACEA.

## MEGALODONTIDÆ.

† *Conchodus* (*Conchodon*, Stopp.), from the Alpine Trias; TAUSCH, Verh. geol. Reichsanst. 1891, p. 75.

† *Megalodon* discussed in its relation to *Pachyerisma* and *Diceras*; BOEHM, Ber. Ges. Freiburg, vi, pp. 53–56, fig.

† *M. pumilus*, Gumb. : the type of a n. g. *Protodicerus*; *id. t. c.* p. 51.

† *M. suboratus*, n. sp., Devonian of Manitoba, WHITEAVES, Tr. R. Soc. Canada, viii, Sect. 4, p. 97, fig.

† *Pachyerisma* discussed in its relation to *Megalodon* and *Diceras*; *Pachymegalodon* is a synonym for it; BOEHM, Ber. Ges. Freiburg, vi, pp. 33–56, fig.

✓† *Protodiceras*, n. g., type *Megalodon pumilus*, Gumb. ; BOEHM, Ber. Ges. Freiburg, vi, p. 51, fig.

## CYPRINIDÆ.

*Arcticidæ*, n. n. is proposed for *Cyprinidæ* since the name of the type genus *Cyprina* is preoccupied, and Schumacher's name, *Arctica*, has to be revived for it; NEWTON, (293) p. 295.

† *Anisocardia blauenensis*, *humilis*, *bernensis*, n. spp., Lower Corallian of the Bernois Jura, LORIOU, Abh. Schw. pal. Ges. xviii, pp. 182–184, figs.

✓† *Bradicardia*, n. g., allied to *Libitina*, with *B. kobyi*, n. sp., Lower Corallian of the Bernois Jura; LORIOU, Abh. Schw. pal. Ges. xviii, pp. 190 & 191, figs.

† *Cyprina maresi*, n. sp., Cretaceous of Tunis, PERON, Exped. Scient. Tunisie, p. 297, fig.

*Isocardia*: anatomy of; MÉNÉGAUX, (279) pp. 150–152, fig.

† *Trapezium naamanense*, n. sp., Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 406, fig.

† *Coralliophaga brachia*, n. sp., Oligocene of Etampes, COSSMANN, J. de Conch. xxxi, p. 280, fig.

† *Veleda elliptica*, n. sp., Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 406, figs.

## VENERIDÆ.

† *Callista syriaca*, n. sp., Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 411, fig.

† *Caryates globulus*, n. sp., Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 410, fig.

*Circe striata*, *undulata*, n. spp., Mediterranean, LOCARD, Ann. Soc. L. Lyon, xxxvii, p. 302.

*Cytherea gracilenta*, *rugata*, n. spp., Mediterranean, LOCARD, Ann. Soc. L. Lyon, xxxvii, pp. 284 & 285.

*C. (Caryatis) yerburyi*, n. n. for *Dione erubescens*, Reeve, non Dunker; SMITH, P. Z. S. 1891, p. 423.

*Dosinia complanata*, n. sp., French Atlantic Coast, LOCARD, Ann. Soc. L. Lyon, xxxvii, p. 287.

✓ *Eutivela*, n. subg. of *Meretrix*; *E. perplexa* and *E. iheringi*, n. spp., Brazil, DALL, Naut. v, pp. 28 & 29, figs.

*Lucinopsis pellucida*, n. sp., S. Australia, TATE, Tr. R. Soc. S. Austr. xiv, p. 263, fig.

*Meretrix*: for n. subg. and 2 n. sp. see *Eutivela*.

*Sunetta contempta*, n. n. for *Meroë menstrualis*, Reeve, non Menke ; SMITH, P. Z. S. 1891, p. 422.

↓ *Sunettina*, n. g. for equilateral forms of *Sunetta*, with *S. sunettina*, n. sp., Aden ; JOUSSEAUME, Le Nat. 1891, p. 208.

† *Tapes* (?) *vernassina*, n. sp., Senonian of Friuli ; TOMMASI, Atti Ist. Venet. vii, ii, p. 1104, fig.

*Venus chevreuxi*, Senegal, DAUTZENBERG, Mém. Soc. Zool. iv, p. 60, fig. ; † *V. himerensis, de-gregori*, Oligocene of Sicily, CIOFALO, Atti Ac. Gioen. ii, pp. 87 & 88, figs. ; *V. (Chione) effeminata*, Panama Bay, STEARNS, P. U. S. Nat. Mus. xiii, p. 221 : n. spp.

## CYRENIDÆ.

*Corbicula lemoinei*, Annam, MORLET, J. de Conch. xxxi, p. 253, fig. ; *C. sikora*, Riv. Mangoro, Madagascar, ANCEY, Bull. Soc. Mal. Fr. vii, p. 345 ; † *C. (Batissa ?) hamlini*, Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 407, fig. : n. spp.

† *Corbiculopsis birdi*, n. sp., Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 409, fig.

† *Cyclas allardi*, n. sp., Danien of Saint-Remy, NICOLAS, C.R. Ass. Fr. Sci. 1890, ii, p. 362, fig.

† *Isodoma simplex*, n. sp., Danien of Saint-Remy, NICOLAS, C.R. Ass. Fr. Sci. 1890, ii, p. 362, fig.

*Pisidium langleyanum*, Port Elizabeth, MELVILL & PONSONBY, Ann. N. H. viii, p. 237 ; *P. ovampicum*, Omamonde (Damaraland), ANCEY, Bull. Soc. Mal. Fr. vii, p. 161 : n. spp.

↓ *Primella* proposed as a new name for the Calyculate group of *Sphærium* ; COOPER, P. Calif. Ac. Sci. iii, p. 82.

*Sphærium raymondi*, n. sp., California, COOPER, P. Calif. Ac. Sci. iii, p. 74, fig.

## CYRENELLIDÆ.

*Cyrenoida rhodopyga*, n. sp., Congo, MARTENS, SB. nat. Fr. 1891, p. 18.

## UNGULINIDÆ.

*Azinus* and *Cryptodon* are distinct but allied genera, and not synonyms ; PEELSENER, Bull. Soc. Mal. Belg. 1890, p. xxxv.

† *Diplodonta kobyi*, n. sp., Lower Corallian of the Bernois Jura ; LORIOL, Abh. Schw. pal. Ges. xviii, p. 202, fig.

## DONACIDÆ.

↓ † *Delia*, n. g., allied to *Donax*, with *D. amæna*, n. sp., Lower Corallian of the Bernois Jura ; LORIOL, Abh. Schw. pal. Ges. xviii, pp. 246 & 247, fig.

*Donax* : anatomy of ; PEELSENER, Arch. Biol. xi, p. 204, fig.

*D. brasieri*, New South Wales, SMITH, P. Z. S. 1891, p. 491, fig.; †*D. minutissimus*, Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 411, fig. : n. spp.

†*Herouvalia*, n. n. for *Asaphinella*, COSSMANN, pars; COSSMANN in HARRIS & BURROWS, (168) p. 114.

## PSAMMOBIIDÆ.

*Psammotellina* : anatomy ; MÉNÉGAUX, (279) pp. 166–169.

†*Soletellina difficilis*, n. sp., Oligocene of Etampes, COSSMANN, J. de Conch. xxxi, p. 271, fig.

## SOLENIIDÆ.

†*Orthonota corrugata*, n. sp., Devonian of Manitoba ; WHITEAVES, Tr. R. Soc. Canada, viii, sect. 4, p. 98, fig.

*Solen* : anatomy of ; MÉNÉGAUX, (279) pp. 170–176, fig

*S. digitalis*, n. sp., Aden, JOUSSEAUME, Le Nat. 1891, p. 183.

## MYACEA.

## MESODESMATIDÆ.

*Mesodesma elongata*, n. sp., French Coasts, LOCARD, Ann. Soc. L. Lyon, xxxvii, p. 270.

## MACTRIDÆ.

*Lutraria* : anatomy of ; MÉNÉGAUX, (279) pp. 157–165, figs.

*L. turneri*, n. sp., Aden, JOUSSEAUME, Le Nat. 1891, p. 207.

*Mactra* : anatomy of ; PELSENEER, Arch. Biol. xi, p. 205, fig. ; MÉNÉGAUX, (279) pp. 155 & 156, figs.

*M. gracilis*, n. sp. [?, dated 1888 !], Coasts of N. W. France, LOCARD, Bull. Soc. Mal. Fr. vii, p. 4, fig.; *M. bourguignati*, n. sp. [?], N. W. Coast, France, LOCARD, t. c. p. 47, fig. : †*M. ? olivensis*, Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 412, fig. : n. spp.

## MYIDÆ.

†*Corbula henckeliusi* : accessory plate ; VINCENT, Bull. Soc. Mal. Belg. 1890, p. vii.

†*C. neaeroides*, Cretaceous of Syria, BLANCKENHORN, (21) p. 96 ; †*C. olivæ*, Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 413, fig. ; †*C. tumida, sublineata*, Cretaceous of Upper Bavaria, BOEHM, Palæontogr. xxxviii, p. 71, figs. : n. spp.

†*Corbulomya lamberti*, n. sp., Oligocene of Etampes ; COSSMANN, J. de Conch. xxxi, p. 267, fig.

*Mya* : anatomy of ; PELSENEER, Arch. Biol. xi, p. 206, fig. ; MÉNÉGAUX, (279) pp. 177 & 178.

*Tugonia adenensis*, n. sp., Aden, JOUSSEAUME, Le Nat. 1891, p. 201.

## GASTROCHÆNIDÆ.

*Gastrochaena* : structure of the shelly tube ; SLUITER, Nat. Tijdschr. Nederl. Ind. 1, p. 45, figs.

†*G. greppini*, n. sp., Lower Corallian of the Bernois Jura, LORIOI, Abh. Schw. pal. Ges. xviii, p. 176, fig.

## ADESMACEA.

## PHOLADIDÆ.

Accessory plates and their use in classification ; DUBOIS, Bull. Soc. Mal. Fr. vii, p. 349.

*Pholadea* : monograph by CLESSIN in MARTINI & CHEMNITZ, xi, Abth. 4.

*Martesia roseotincta*, n. sp., Aden, JOUSSEAUME, Le Nat. 1891, p. 183.

*Pholas* : anatomy of ; PELSENEER, Arch. Biol. xi, p. 206-208, figs. ; MÉNÉGAUX, (279) pp. 181 & 182, figs. *P. candida*: letters on depauperated forms ; WALSINGHAM, Tr. Norw. Soc. v, p. 79.

## TEREDINIDÆ.

*Teredo* : anatomy of ; PELSENEER, Arch. Biol. xi, pp. 208-210, figs. ; MÉNÉGAUX, (279) pp. 183-200, figs.

## DIBRANCHIA.

## LUCINACEA.

## LUCINIDÆ.

†*Corbis episcopalis*, *kobyi*, *valfinensis*, *burensis*, Lower Corallian of the Bernois Jura ; LORIOI, Abh. Schw. pal. Ges. xviii, pp. 193-200, figs.  
†*C. manzavinii*, Trias of Asia Minor, BITTNER, JB. geol. Reichsanst. xli, p. 115, fig. : n. spp.

†*Corbicella greppini*, n. sp., Lower Corallian of the Bernois Jura, LORIOI, Abh. Schw. pal. Ges. xviii, p. 201, fig.

*Lucina* : anatomy of ; PELSENEER, Arch. Biol. xi, p. 202, fig. ; MÉNÉGAUX, (279) pp. 143-149, figs.

*L. elata*, Mediterranean, LOCARD, Ann. Soc. L. Lyon, xxxvii, p. 313 ;  
*L. equizonata*, California, STEARNS, P. U. S. Nat. Mus. xiii, p. 220, fig. ;  
†*L. argentina*, Tithonian of Rodeoviejo, Argentine Republic, BEHRENDSEN, Z. geol. Ges. xliii, p. 415, fig. ; †*L. blauenensis*, *compressiuscula*, *merope*, *aspasia*, *drya*, *lydia*, *erina*, *burensis*, *phædra*, *octavia*, *diana*, *subplebeia*, *bohmi*, Lower Corallian of the Bernois Jura, LORIOI, Abh. Schw. pal. Ges. xviii, pp. 203-217, figs. ; †*L. gemellaroii*, Oligocene of Sicily, CIOFALO, Atti Acc. Gioen. ii, p. 87, fig. ; †*L. percancelata*, Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 403, fig. ; †*L. plesio-*



*morpha*, Oligocene of Etampes, COSSMANN, J. de Conch. xxxi, p. 260, fig.; †*L. chonioides*, fig., *id. ibid.*; †*L. ? townsendi*, Mesozoic?, Straits of Magellan, WHITE, P. U. S. Nat. Mus. xiii, p. 14, fig.; †*L. (Jagonia) actinophora*, Tertiary of Grand Canary, ROTHPLETZ & SIMONELLI, Z. geol. Ges. xlii, p. 705, fig. : n. spp.

†*Parvicorbis*, n. n. for *Bernayia*, COSSM. ; COSSMANN in HARRIS & BULL, (168) p. 114.

## TELLINACEA.

### TELLINIDÆ.

†*Arcopagia planissima*, n. sp., Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 409, fig.

†*Linearia blanda*, n. sp., Lower Corallian of the Bernois Jura, LORIOU, Abh. Schw. pal. Ges. xviii, p. 180, fig.

*Tellina*; anatomy; MÉNÉGAUX, (279) pp. 166–169.

†*T. fraasi*, Cretaceous of Upper Bavaria, BOEHM, Palæontogr. xxxviii, p. 72, fig.; *T. idæ*, San Pedro, California, DALL, P. U. S. Nat. Mus. xiv, p. 183, fig.; *T. vincentiana*, S. Australia, TATE, Tr. R. Soc. S. Austr. xiv, p. 262, fig.; *T. (Angulus ?) adenensis, subpallida*, Aden, SMITH, P. Z. S. 1891, p. 426, figs. : n. spp.

### SCROBICULARIIDÆ.

†*Lavignon frontebroides*, n. sp., Cretaceous of Tunis, PERON, Exped. Scient. Tunisie, p. 319, fig.

*Semele monilis*, n. sp., Australia, TATE, Tr. R. Soc. S. Austr. xiv, p. 261, fig.

## ANATINACEA.

### CUSPIDARIIDÆ.

*Cuspidaria*, anatomy of; PELSENEER, Arch. Biol. xi, pp. 223–228, figs.

*C. (Myonera) lischkei*, n. sp., Challenger Station 237, Japan, SMITH, P. Z. S. 1891, p. 438, fig.

### SOLENOMYIDÆ.

*Solenomya*, anatomy of; PELSENEER, Arch. Biol. xi, pp. 175–183, fig.

*Solemya johnsoni*, n. sp., off Coast Lower California, DALL, P. U. S. Nat. Mus. xiv, p. 189.

### PANDORIDÆ.

*Pandora edwardsi*, n. sp., JOUSSEAUME, Le Nat. 1891, p. 201.

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## VERTICORDIIDÆ.

*Lyonsiella*, anatomy of ; PELSENEER, Arch. Biol. xi, pp. 215-217, figs.

*Verticordia* (*Euciroa*) *eburnea*, n. sp., Andaman Sea, WOOD-MASON & ALCOCK, Ann. N. H. viii, p. 447, fig.

## LYONSIIDÆ.

*Lyonsia*, anatomy of ; PELSENEER, Arch. Biol. xi, pp. 211-214, figs.

## ARCOMYIDÆ.

†*Goniomya jacobi*, n. sp., Lias of Longobucco, FUCINI, Bull. Soc. Mal. Ital. xvi, p. 61.

†*Homomya bodenbenderi*, n. sp., Lias of Portezuelo, Argentine Republic, BEHRENDSEN, Z. geol. Ges. xliii, p. 385, fig.

†*Pleuromya longobucchensis*, *seguenzæ*, n. spp., Lias of Longobucco, FUCINI, Bull. Soc. Mal. Ital. xvi, p. 63, figs.

## ANATINIDÆ.

†*Anatina blauenensis*, Lower Corallian of the Bernois Jura, LORIOI, Abh. Schw. pal. Ges. xviii, p. 177 ; †*A. P. orientalis*, Cretaceous of Syria, WHITFIELD, Bull. Am. Mus. Nat. Hist. iii, p. 412, fig. : n. spp.

†*Cercomya angustissima*, Tithonian of Rio Malargue, Argentine Republic, BEHRENDSEN, Z. geol. Ges. xliii, p. 414 ; †*C. elisæ*, Lias of Longobucco, FUCINI, Bull. Soc. Mal. Ital. xvi, p. 63, fig. : n. spp.

*Periploma discus*, n. sp., California, STEARNS, P. U. S. Nat. Mus. xiii, p. 222, fig.

*Poromya*, anatomy of ; PELSENEER, Arch. Biol. xi, pp. 218-222, fig.

## PHOLADOMYIDÆ.

†*Pholadomya augusta*, *comottii*, *variscoi*, Senonian of Friuli, TOMMASI, Atti Ist. Venet. (7), ii, pp. 1100-1102, figs. ; †*P. schlumbergeri*, Cretaceous of Tunis, PERON, Exped. Scient. Tunisie, p. 326, fig. : n. spp.

## INCERTÆ SEDIS.

†*Coquandia coynei*, n. sp., Cretaceous of Tunis, PERON, Exped. Scient. Tunisie, p. 317, fig.

†*Entovalva*, n. g., for *E. mirabilis*, n. sp., parasitic in alimentary canal of *Synapta*, from Zanzibar ; VOELTZKOW, Zool. Jahrb. v, Syst. p. 619, fig. : probably allied to *Galeomma* ; FISCHER, J. de Conch. xxxi, p. 6.

†*Spathella lebescontei*, n. sp., Grès Armoricaïn of Brittany, BARROIS, Ann. Soc. Géol. Nord. xix, p. 161, fig.

# BRACHIOPODA.

BY

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Some points in the anatomy of *Lingula anatina* ; FRANÇOIS (17).

Circulation in *Lingula anatina* ; FRANÇOIS (17).

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All Brachiopods have a common form of embryonic shell—the protegulum ; BEECHER (1).

Methods employed at the Zoological Station at Naples for the preservation of marine animals ; LO BIANCO, Bull. Sci. Fr. Belg. xxiii [*Brachiopoda*] p. 142.—List of figured specimens of fossil *Brachiopoda* in York Museum ; Rep. Yorks. Phil. Soc. 1890, pp. 62–64.—Catalogue of *Brachiopoda* in his collection ; PAETEL (28).

## III.—DISTRIBUTION.

## A.—GEOGRAPHICAL.

*Lusitanian Province.*

*Brachiopoda* of the Travailleur and Talisman Expeditions, 21 species ; FISCHER & EHLERT (16).—Spanish peninsula ; HIDALGO (26).—French coasts ; LOCARD (27).

*West African Province.*

Senegal, 3 species : DAUTZENBERG (12).

*Indo-Pacific Province.*

Indo-China, 2 species of *Lingula* cited ; FISCHER (15).

Philippines, *Terebratulina kiiensis*, n. sp., or var. ; DALL & PILSBRY (10).

*Austro-Zelandic Province.*

Tasmania : list of species ; JOHNSTON, P. R. Soc. Tasm. 1890, p. 151.

*Japanese Province.*

Japan : recent species (*Eudesia raphaelis*, n. sp.) ; DALL & PILSBRY (11).

## B.—GEOLOGICAL.

Madagascar, list of the known fossil forms ; Ant. Annual, xiv, p. 243.

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Tertiary of Turin, with derived Mid. Lias fossils ; PARONA (29).—Lower Pliocene of Borzoli ; CAMPANA (8).

Cretaceous: Upper Bavaria (*Thecidea rothpletzi*, n. sp.); BOEIM (6).—*Terebratulina suborbicularis*, n. sp., Syria; BLANCKENHORN (5).

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Lias: *Waldheimia perforata*, showing colour-markings, WILSON (36): species from the Province of Belluno, UHLIG (31): 3 new species from Longobucco, FUCINI (18): 2 new species from Sicily, DI-STEPHANO (13): Liassic species from the Argentine Republic, BEHRENDSEN (2): Middle Lias forms in Tertiary Beds of Turin, PARONA (29).

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Lower Palæozoic, Salt Range, India: *Orthis warthi*, n. sp.; WAAGEN (32).

Silurian of Saskatchewan, 2 new species; WHITEAVES (33).

Cambrian of Sardinia; BORNEMANN (7).

#### IV.—SYSTEMATIC.\*

BEECHER (1) proposes to divide the *Brachiopoda* into *Atremata*, *Neotremata*, *Protremata*, and *Telotremata*.

Notes on recent forms; DALL, P. Ac. Philad. 1891, p. 172, 1 pl.

†List of figured specimens in the York Museum; Rep. Yorks. Phil. Soc. 1890, pp. 62–64.—†Lists of the *Brachiopoda* found fossil in the neighbourhood of Cracow; ŻARĘCZNY, Sprawozd. Kom. fizyogr. xxiii, pp. 29–32, and xxv, pp. 103 & 104.

#### INARTICULATA.

##### LINGULIDÆ.

*Lingua*: 2 species and their distribution in Indo-Chinese waters; FISCHER, (15) p. 162.

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†*Discina magnifica*, n. sp., Waverly beds of Ohio; HERRICK, Bull. Geol. Soc. Am. ii, p. 46.

\* For convenience, the arrangement adopted by Fischer in his Manual is followed here. † is placed before extinct forms.

## ARTICULATA.

## STROPHOMENIDÆ.

†*Orthis* : suggestions for the subdivision of the genus ; HALL, Bull. Geol. Soc. Am. i (1890) p. 19.

†*O. warthi*, n. sp., Lower Palæozoic, Salt Range, India, WAAGEN, Pal. Ind. iv, p. 102, fig.

†*Strophomena acanthoptera*, n. sp., Silurian of Saskatchewan ; WHITEAVES, Can. Rec. iv, p. 294, figs.

## SPIRIFERIDÆ.

†*Athyris læviuscula*, Sow., loop described ; GLASS, Geol. Mag. 1891, p. 495, fig.

†*A. parvula*, n. sp., Devonian of the Mackenzie River basin, WHITEAVES, Geol. Surv. Canada, Contrib. to Canadian Palæont. i, p. 228, fig.

†*Spirifera* : inter-relations of the genus ; HALL, Bull. Geol. Soc. Am. i (1890) p. 567.

†*Spiriferina mûtschi*, Lower Lias of Bodmi (Switzld.), HAAS, Abh. Schw. pal. Ges. xviii, p. 129, fig. ; †*S. myrina* [not defined], Trias of the Raxalpe, BITTNER, Verh. geol. Reichsanst. 1891, p. 56 : n. spp.

†*Spirigera manzavinii*, n. sp., Trias of Asia Minor, BITTNER, JB. geol. Reichsanst. xli, p. 107, fig.

## RHYNCHONELLIDÆ.

†*Eatonia variabilis*, n. sp., Devonian of the Mackenzie River basin, WHITEAVES, Geol. Surv. Canada, Contrib. to Canadian Palæont. i, p. 233, fig.

†*Neatretia*, n. n. for *Cryptopora* and *Atretia* of Jeffreys ; FISCHER & EHLERT, (16) p. 122.

†*Pentamerus decussatus*, n. sp., Silurian of Saskatchewan, WHITEAVES, Can. Rec. iv, p. 295, fig.

†*Rhynchonella anatolica, levantina*, Trias of Asia Minor, BITTNER, JB. geol. Reichsanst. xli, pp. 106 & 107, fig. ; †*R. eleuteria*, p. 203, *ptinoides*, p. 206, Lias of Trapani, DI-STEFANO, Atti Acc. Gioen. iii ; †*R. pseudo-personata*, Jurassic of Orenburg, SINTZOV, Zapiski Novoross. Obsch. Estestv. xv, p. 121 ; †*R. seydelii* [not defined], Trias of the Raxalpe, BITTNER, Verh. geol. Reichsanst. 1891, p. 56 : n. spp.

## TEREBRATULIDÆ.

*Eudesia* [= *Waldhemia*] more closely related to *Terebratella* and *Megerlia* than to *Terebratula* proper ; DALL & PILSBRY (11).

*Eudesia raphaelis*, n. sp., Japan, DALL & PILSBRY, P. Ac. Philad. 1891, p. 171.



†*Newberria*, n. g., type *Rensselæria johanni*, Hall ; HALL in WHITEAVES, Geol. Surv. Canada, Contrib. to Canadian Palæont. i, p. 236, fig.

†*Terebratella boisellieri*, n. sp., Callovian of Velluire (Vendée), GROSSOUVRE, Bull. Soc. Géol. xix, p. 257, fig.

†*Terebratula chartroni*, Callovian of Velluire (Vendée), GROSSOUVRE, Bull. Soc. Géol. xix, p. 255, fig. ; †*T. dorenbergi*, Upper Jurassic of Mexico, FELIX, Palæontogr. xxxvii, p. 176, fig. ; †*T. sestii*, Lias of Longobucco, FUCINI, Bull. Soc. Mal. Ital. xvi, p. 33, figs. ; †*T. turcica*, Trias of Asia Minor, BITTNER, JB. geol. Reichsanst. xli, p. 105, fig. : n. spp.

*Terebratulina (unguicula*, Cpr., var. ?) *kienensis*, Philippines, DALL & PILSBRY, Naut. v, p. 18, 1 pl. ("If more material should prove that the supposed variety cannot be connected with *unguicula*, the varietal name can be taken as specific") ; †*T. suborbicularis*, Cretaceous ?, Syria, BLANCKENHORN, (5) p. 71, fig. : n. spp.

†*Waldheimia perforata*, showing colour-markings ; WILSON, Geol. Mag. 1891, p. 458, fig.

†*W. mazzai*, *anconaeana*, Lias of Longobucco, FUCINI, Bull. Soc. Mal. Ital. xvi, p. 38, figs. ; †*W. (Aulacothyris) zugmayeri, compressa* [not defined], Trias of the Raxalpe, BITTNER, Verh. geol. Reichsanst. 1891, p. 55 : n. spp.

#### STRINGOCEPHALIDÆ.

†*Stringocephalus burtini*, in the Devonian of Manitoba, WHITEAVES, Tr. R. Soc. Canada, viii, Sect. 4, p. 93, fig.

#### THECIDEIDÆ.

†*Thecidea rothpletzi*, n. sp., Cretaceous of Upper Bavaria, BOEHM, Palæontogr. xxxviii, p. 93, fig.

# POLYZOA.

BY

B. B. WOODWARD, F.G.S., F.R.M.S., &c.

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## I.—TITLES.\*

1. °DAVENPORT, C. B. [A paper on Budding in *Bryozoa*. P. Am. Ac. 1891, pp. 278-282.] Abstr. in J. R. Micr. Soc. 1891, pp. 456 & 457.
2. —. Observations on Budding in *Paludicella* and some other *Bryozoa*. Bull. Mus. C. Z. xxii, No. 1, 114 pp., 12 pls. Abstr. in J. R. Micr. Soc. 1892, p. 28.
3. DOLLFUS, G. F. Bryozoaires. [Summary of the palæontological papers for 1889.] Ann. Géol. univ. Paris, vi, pp. 921-933.
4. HARMER, S. F. On the nature of the excretory processes in Marine *Polyzoa*. P. Camb. Phil. Soc. vii, p. 219, and Nature, xlv, p. 143. Abstr. in J. R. Micr. Soc. 1892, pp. 197 & 198.
5. —. On the Regeneration of Lost Parts in *Polyzoa*. Rep. Brit. Ass. 1890 (1891), pp. 862 & 863. Abstr. in J. R. Micr. Soc. 1891, p. 457.
6. —. On the British Species of *Crisia*. Q. J. Micr. Sci. xxxii, pp. 127-181, 1 pl. Abstr. in J. R. Micr. Soc. 1891, p. 335.
7. HINCKS, T. Contributions towards a General History of the Marine *Polyzoa*. xv. South African and other *Polyzoa*. Ann. N. H. vii, pp. 285-298, 2 pls. Appendix, t. c. viii, pp. 86-93, 169-176, & 471-480.

New species described in the main work and referred to in the Appendix are in the latter still designated "n. sp."!

8. HUTTON, F. W. Revised list of the Marine *Bryozoa* of New Zealand. Tr. N. Z. Inst. xxiii, pp. 102-107.

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\* An asterisk prefixed to a quotation indicates that the Recorder has not seen the journal or work referred to.

9. MACGILLIVRAY, P. H. Descriptions of new or little-known [Australian] *Polyzoa*. Pt. xiv. P. R. Soc. Vict. iii, pp. 77-83, 2 pls.
10. —. [Victorian *Polyzoa*.] Prodr. Zool. Vict. xx (1890), pp. 345-357, 2 pls.
11. NAMIAS, I. Contributo ai *Briozoi* Pliocenici delle Provincie di Modena e Piacenza. Boll. Soc. geol. Ital. ix, pp. 471-513, 1 pl.
12. OKA, A. Observations on Freshwater *Polyzoa*. (*Pectinatella gelatinosa*, n. sp.) J. Coll. Sci. Japan, iv, pp. 89-150, 4 pls. Abstr. in J. R. Micr. Soc. 1891, pp. 457 & 458.
13. PERGENS, E. *Bryozoaires* du Miocene du Gard. Bull. Soc. Belg. Geol. v, pp. 46-54.
14. PROUHO, H. Étude sur le *Loxosoma annelidicola*: *Cyclatella annelidicola* (Van Beneden et Hesse). Arch. Z. expér. ix, pp. 91-116, 1 pl. Abstr. in J. R. Micr. Soc. 1891, pp. 585 & 586.
15. —. Sur trois cas de développement libre observés chez les *Bryozoaires* ectoproctes. C.R. cxii, pp. 1316-1318. Abstr. in J. R. Micr. Soc. 1891, p. 728.
16. —. Sur le développement de la *Membranipora pilosa*. C.R. Ass. Fr. Sci. 1890, ii, pp. 517-519.
17. ROTHPLETZ, A., & SIMONELLI, V. Die marinen Ablagerungen auf Gran Canaria. Z. geol. Ges. xlii, pp. 677-736, 2 pls. *Polyzoa*, pp. 697-699.
- SIMONELLI, V. [See ROTHPLETZ & SIMONELLI (17).]
18. VINES, G. R. Report of the Committee . . . appointed to prepare a Report on the Cretaceous *Polyzoa*. Rep. Brit. Ass. 1890 (1891) pp. 378-396.
19. WATERS, A. W. On Chilostomatous Characters in *Meliceritidæ* and other fossil *Bryozoa*. Ann. N. H. viii, pp. 48-53. Abstr. in J. R. Micr. Soc. 1891, p. 586.
20. —. North Italian [fossil] *Bryozoa*. Q. J. Geol. Soc. xlvii, pp. 1-34, 4 pls.
21. WHITEAVES, J. F. The Fossils of the Devonian Rocks of the Mackenzie River Basin. Geol. Surv. Canada, Contrib. to Canadian Palæont. i. *Polyzoa*, pp. 210-214, pls.

## II.—ANATOMY, &c.

Anatomy of *Loxosoma annelidicola*; PROUHO (14). — Anatomy of *Pectinatella gelatinosa*, n. sp.; OKA (12).

WATERS (19) again calls attention to the presence of *Avicularia* in the Cretaceous *Meliceritidæ*—the “cellules accessoires” of D’Orbigny. The characters of this group are, in the main, Chilostomatous, united with

some that are Cyclostomatous. In a very large section of Palæozoic forms, there are important structures similar to those in recent *Chilostomata*.

Excretion not performed by organs comparable with nephridia ; but carried on by free mesoderm cells, and by connective tissue, and by the walls of the alimentary canal ; HARMER (4).

Free development in three cases of Ectoproctous *Polyzoa* (*Alcyonidium albidum*, *Membranipora pilosa*, and *Hypophorella expansa*) ; PROUHO (15) : the author concludes that the Cyphonautes form is the larva of all *Polyzoa* whose ova undergo free development.

Budding in *Loxosoma amelidicola* ; PROUHO (14).—Budding in *Paludicella* and other *Bryozoa*, including summary of a general scheme of the budding process in *Ectoprocta* ; DAVENPORT (2).—Development of *Pectinatella gelatinosa*, n. sp. ; OKA (12).—Development of *Membranipora pilosa* ; PROUHO (16).

Reproduction of lost parts, especially in *Crisia* ; HARMER (5).

Methods employed at the Zoological Station at Naples for the preservation of marine animals ; LO BIANCO, Bull. Sci. Fr. Belg. xxiii [*Bryozoa*], p. 142.

### III.—DISTRIBUTION.

#### A.—GEOGRAPHICAL.

Baltic : Ber. Komm. wiss. Unters. deutsch. Meere, vi, p. 116.

British species of *Crisia*, 1 new ; HARMER (6).—Falmouth : *Polyzoa* taken near Falmouth in 1891 ; VALENTIN, Rep. R. Cornwall Polytech. Soc. 1891, pp. 95 & 96.

Malta : *Lepralia ocellata*, n. sp. ; HINCKS (7).

Port Elizabeth : 5 new species ; HINCKS (7).

Singapore or Philippines : *Mucronella aviculifera*, n. sp., HINCKS (7).

Australia : 7 new species, MACGILLIVRAY (9).—Queensland : *Membranipora eburnea* and *Schizoporella concinna*, n. spp., HINCKS (7).—Victoria : *Beania conferta*, new, and 10 other species recorded, MACGILLIVRAY (10).

New Zealand : list of marine species ; HUTTON (8).—Stewart Is. : *Schizoporella spectabilis*, n. sp., HINCKS (7).

Japan : *Pectinatella gelatinosa*, n. sp., Freshwater, Tokio, OKA (12).

#### B.—GEOLOGICAL.

Tertiary forms from the marine strata of Grand Canary ; ROTHPLETZ & SIMONELLI (17).

Pliocene *Bryozoa* from the Province of Modena and Piacenza, 3 new species ; NAMIAS (11).

Miocene *Polyzoa* of Gard ; PERGENS (13).—*Terebripora archiaci* from the Calcare di Acqui (Alto Monferrato) ; TRABUCCO (v. ante *Moll.* No. 440).

List of Upper Eocene *Polyzoa* of N. Italy, with 1 n. g. and 9 n. spp. ; WATERS (20).

Cretaceous *Polyzoa* : a report supplementary to those of 1883 & 1884, and dealing with the stratigraphical distribution of British Cretaceous *Polyzoa* only ; VINES (18).

Senonian of Royan : *Melicerites royana*, n. sp., WATERS (19).

Devonian : 3 new species from the Mackenzie River Basin (Canada) ; WHITEAVES (21).

#### IV.—SYSTEMATIC.

† is prefixed to fossil forms.

#### ENTOPROCTA.

##### LOXOSOMIDÆ.

*Loxosoma annelidicola* (described as *Cyclatella* by Van Beneden & Hesse), anatomy and reproduction ; PROUHO, Arch. Z. expér. ix, pp. 91–116, figs.

#### ECTOPROCTA.

##### GYMNOLÆMATA.

##### CYCLOSTOMATA.

##### CRISIDÆ.

*Crisia* : British species, *C. ramosa* (p. 134), n. sp., HARMER, Q. J. Micr. Sci. xxxii, p. 127, figs.

##### TUBULIPORIDÆ.

†*Proboscina laxa*, n. sp., Devonian of the Mackenzie River Basin ; WHITEAVES, Geol. Surv. Canada, Contrib. to Canadian Palæont. i, p. 212, fig.

†*Stomatopora moniliformis*, n. sp., Devonian of the Mackenzie River Basin ; WHITEAVES, Geol. Surv. Canada, Contrib. to Canadian Palæont. i, p. 212, fig.

##### FRONDIPORIDÆ.

*Fasciculipora levis*, n. sp., Victoria, MACGILLIVRAY, P. R. Soc. Vict. iii, p. 82.

##### MONTICULIPORIDÆ.

†*Monotrypella unjiga*, n. sp., Devonian of the Mackenzie River Basin, WHITEAVES, Geol. Surv. Canada, Contrib. to Canadian Palæont. i, p. 215, fig.

## MELICERTITIDÆ.

The characters of this group are in the main Chilostomatous, united with some that are Cyclostomatous ; WATERS, Ann. N. H. viii, p. 53.

† *Melicertites royana*, n. sp., Senonian of Royan, WATERS, Ann. N. H. viii, p. 51, fig.

## CTENOSTOMATA.

## ALCYONIDIIDÆ.

*Alcyonidium albidum* : free development ; PROUHO, C.R. cxii, p. 1316.

## VESICULARIDÆ.

*Hypophorella expansa*, Ehlers : free development ; PROUHO, C.R. cxii, p. 1316.

## PALUDICELLIDÆ.

*Paludicella*: budding; DAVENPORT, Bull. Mus. C. Z. xxii, pp. 1-114, pls.

## CHILOSTOMATA.

*Cellularina*.

## CELLULARIIDÆ.

† *Scrupocellaria brendoleniis*, *montecchiensis*, n. spp., Upper Eocene, N. Italy, WATERS, Q. J. Geol. Soc. xlvii, p. 7, figs.

## BICELLARIIDÆ.

*Beania conferta*, n. sp., Victoria, MACGILLIVRAY, Prodr. Zool. Vict. xx, p. 346, fig.

## CELLARIIDÆ.

† *Salicornaria mutinensis*, n. sp., Pliocene of Modena, NAMIAS, Boll. Soc. geol. Ital. ix, p. 484, fig.

*Flustrina*.

## FLUSTRIDÆ.

*Euthyris woosteri*, n. sp., Cooktown, Queensland, MACGILLIVRAY, P. R. Soc. Vict. iii, p. 77, fig.

*Flustra spinuligera*, p. 286, *F. nobilis*, p. 288, n. spp., Port Elizabeth, HINCKS, Ann. N. H. vii, figs.

## MEMBRANIPORIDÆ.

*Bifustra aciculata*, n. sp., Port Jackson, MACGILLIVRAY, P. R. Soc. Vict. iii, p. 79, fig.

*Membranipora sejuncta*, Port Phillip, Victoria, MACGILLIVRAY, P. R. Soc. Vict. iii, p. 78, fig.; *M. eburnea*, Queensland, ? HINCKS, Ann. N. H. vii, p. 289, fig.; †*M. regularis*, Pliocene of Castellarquato, NAMIAS, Boll. Soc. geol. Ital. ix, p. 487, fig. : n. spp.

*M. pilosa*, Linn., free development; PROUHO, C.R. cxii, p. 1316; also in C.R. Ass. Fr. Sci. 1890, ii, p. 517.

†*Vibracella*, n. g., type *Cellepora trapezoidea*; WATERS, Q. J. Geol. Soc. xlvii, p. 10, fig.

## MICROPORIDÆ.

†*Micropora articulata*, n. sp., Upper Eocene of N. Italy, WATERS, Q. J. Geol. Soc. xlvii, p. 14, fig.

## STEGANOPORELLIDÆ.

*Vincularia* should not be retained as a generic name; MACGILLIVRAY, P. R. Soc. Vict. iii, p. 80.

*Escharina*.

## MYRIOZOIDÆ.

*Schizoporella pulchra*, hab. ?, MACGILLIVRAY, P. R. Soc. Vict. iii, p. 81, fig.; *S. concinna*, p. 289, Queensland, *bimunita*, p. 290, *inconspicua*, p. 291, *scabra*, p. 293, Port Elizabeth, *spectabilis*, p. 292, Stewart Is., New Zealand, HINCKS, Ann. N. H. vii, figs. : n. spp.

## PORINIDÆ.

†*Porina* (?) *bioculata*, n. sp., Upper Eocene of N. Italy; WATERS, Q. J. Geol. Soc. xlvii, p. 26, fig.

## ESCHARIDÆ.

†*Lepralia* (?) *bericensis*, *lontensis*, Upper Eocene of N. Italy, WATERS, Q. J. Geol. Soc. xlvii, p. 21, figs.; *L. ocellata*, Malta, *lancifera*, Port Elizabeth, HINCKS, Ann. N. H. vii, p. 296, figs.; *L. lateralis*, Nichol Bay, N. W. Australia, MACGILLIVRAY, P. R. Soc. Vict. iii, p. 80, fig. : n. spp.

*Mûcronella aviculifera*, n. sp., Singapore or Philippines, HINCKS, Ann. N. H. vii, p. 297, fig.

†*Rhamphostomella brendolensis*, n. sp., Upper Eocene of N. Italy, WATERS, Q. J. Geol. Soc. xlvii, p. 23, fig.

*Smittia obscura*, n. sp., Lorne (Victoria), MACGILLIVRAY, P. R. Soc. Vict. iii, p. 82, fig.

## CATENICELLIDÆ.

†*Catenicella septentrionalis, continua*, n. spp., Upper Eocene of N. Italy, WATERS, Q. J. Geol. Soc. xlvii, pp. 5 & 6, figs.

*Celleporina.*

## CELLEPORIDÆ.

†*Cellepora birostrata*, n. sp., Pliocene of Castellarquato, NAMIAS, Boll. Soc. geol. Ital. ix, p. 502, fig.

## PHYLACTOLÆMATA.

## PLUMATELLIDÆ.

*Pectinatella gelatinosa*, n. sp., Tokyo, its anatomy and development; OKA, J. Coll. Sci. Japan, iv, p. 89, figs.

## VERMIFORMIA.

*Phoronis*: see *Gephyrea* in *Vermes*.



# CRUSTACEA.

BY

CECIL WARBURTON, M.A.

## ARRANGEMENT OF RECORD:

- I.—LIST OF PUBLICATIONS, p. 1.
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- IV.—PHYSIOLOGY, p. 22.
- V.—GEOGRAPHICAL DISTRIBUTION, p. 23.

## I.—LIST OF PUBLICATIONS.

- BARROIS, T. Notes préliminaires sur la faune des eaux douces de l'orient. I. Sur trois *Diaptomus* nouveaux des Environs de Caire. Rev. Biol. iii, pp. 230, 277, & 316.
- BENEDEN, P. J. VAN. (1) Deux *Lernéopodiens* nouveaux recueillis l'un aux Açores, l'autre sur les côtes du Sénégal. (*Brachiella chavesi*, *B. chevreuxi*.) Bull. Ac. Belg. (3) xxii, pp. 23-35, 2 pls.
- . (2) Un Argule nouveau des côtes d'Afrique [*Argulus melita*, n. sp.]. T. c. pp. 369-378, 1 pl.
- BENHAM, W. B. Note on a Couple of Abnormalities. Ann. N. H. (7) vii, pp. 256-258, 1 pl. Abstr. J.R. Micr. Soc. 1891, p. 328.
- BERNARD, H. Hermaphroditism of the *Apodidae*. Nature, xliii, p. 343. Abstr. J. R. Micr. Soc. 1891, p. 188. [See Zool. Rec. xxvii, Crust., BERNARD.]
- BIANCO, LO. Metodos usados en la estación zoológica para la conservación de los animales marinos. An. Soc. Esp. xx, pp. 273-322. Crustacea, p. 310.

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\* An asterisk prefixed to a quotation indicates that the Recorder has not seen the work referred to.

- BIGELOW, R. P. Preliminary Notes on some (4) New Species of *Squilla*. Johns Hopk. Univ. Circ. x, p. 93.
- BLASIUS, W. Die Faunistische Litteratur Braunschweigs und der Nachbargebiete. JB. Ver. Braunschw. vi, p. 293.  
*Crustacea*, p. 348.
- BOLIVAR, J. (1) Noticias sobre la recolección de los Crustáceos. An. Soc. Esp. xix, pp. 2-6.
- . (2) Liste de Crustáceos cerca de San Sebastián. T. c. pp. 115-120.
- BONNIER, J. (1) La glande antennale chez les Amphipodes de la famille des *Orchestiidae*. C.R. cxiii, pp. 808-810.
- . (2) Abstract of his paper on the Dimorphism of male *Amphipoda*. J. R. Micr. Soc. 1891, p. 187. [See Zool. Rec. xxvii, *Crust.*, BONNIER (1).]
- BOUVIER, E. L. (1) Les *Glaucothoés* sont elles des Larves de Pagures? Ann. Sci. Nat. (7) Zool. xii. pp. 65-80.
- . (2) Les Pagures peuvent ils se loger dans les coquilles sénestres? C.R. Soc. Philom. Oct. 1891, No. 1, p. 3.
- . (3) Sur les formations grasses du foie des Crustacés décapodes. T. c. No. 18, p. 2.
- \*——. (4) Étude de quelques *Paguriens* recueillis par M. J. de Guerne sur les côtes de France et de Norvège. Mém. Soc. Zool. Fr. iv, pp. 393-407.
- . (5) Rectification du nom de la *Cænobita rugosa*. Bull. Soc. Philom. (7) iii, p. 21.  
*C. compressa* substituted on account of priority.
- . (6) Observations sur les mœurs des Pagures. *Op. cit.* iv, pp. 5-9.
- . (7) Recherches anatomiques sur le Système artériel des Crustacés décapodes. Ann. Sci. Nat. (7) xi, pp. 197-282, 4 pls. Abstr. J.R. Micr. Soc. 1891, p. 466.
- . (8) Sur les branchies des Paguriens. Ann. Sci. Nat. (7) Zool. xi, p. 402.
- 14 BUMPS, H. C. The Embryology of the American Lobster. J. Morph. v, pp. 215-262, 6 pls.
- BUTSCHINSKI, P. K istorii razvitiya Mizid. [Observations on the development of *Parapodopsus cornuta*, Czern. (*Mysidae*).] Zapiski Novoross. xiv, pp. 79-170, 3 pls.
- BÜTSCHLI, O., & SCHEWIAKOFF, W. Ueber den feineren Bau der quergestreiften Muskeln von Arthropoden. Biol. Centralbl. xi, pp. 33-39, 7 figs. Abstr. J. R. Micr. Soc. 1891, p. 336.
- CAMERANO, L. Ricerche intorno alla forza assoluta dei muscoli dei Crostacei decapodi. Boll. Mus. Zool. Anat. Comp. Torino, vi, pp. 168-176.

- CANO G. (1) Morfologia dell'apparecchio sessuale femminile glandole, del cemento e fecondazione nei Crostacei Decapodi. MT. z. Stat. Neap. ix, pp. 483-531, 1 pl. Abstr. J. R. Micr. Soc. 1891, p. 467.
- (2) Sviluppo postembryonale dei *Dorippidei*, *Lucosiadi*, *Corystoidei* e *Grapsidi*. Mem. Soc. Ital. Sci. Nat. (3) viii, No. 4, 14 pp., 3 pls.
- (3) Sviluppo postembryonale dei *Gonoplacidi*. Atti Ac. Tor. xxvi, pp. 639-648, 1 pl.
- (4) Sviluppo postembryonale della *Gebia*, *Axiu*, *Callianassa* e *Callinax*; morfologia dei *Talassinidi*. Boll. Soc. Nat. Nap. (1) v, pp. 5-30.
- CANU, E. (1) Sur quelques Copépodes parasites observés dans le Boulonnais. C.R. cxiii, pp. 435-437. Abstr. Rev. Sci. xlviii, p. 504.
- (2) Les Copépodes marins du Boulonnais (Continued). v. Les semiparasites. Bull. Sci. Fr. Belg. xxiii, pp. 467-487. [See Zool. Rec. xxvii, Crust., CANU (3).]  
3 new species.
- (3) Abstract of his paper on Sexual Dimorphism of *Copepoda Ascidiicola*. J. R. Micr. Soc. 1891, p. 38. [See Zool. Rec. xxvii, Crust., CANU (1).]
- (4) Abstract of his paper on the Development of *Ascidicolous Copepoda*. J. R. Micr. Soc. 1891, p. 188. [See Zool. Rec. xxvii, Crust., CANU (2).]
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- (2) Die Aufrechterhaltung des Genus *Sapphir*. T. c. p. 72.
- CEDERSTRÖM, G. C. Jakttagelser rörande ehippierna eller vinteräggs-kapslarne hos små-kräftarten *Daphnia pulex*. Öfv. Ak. Förh. xlviii, pp. 159-162.
- CHEVREUX, E. *Podoprion bolivari*, Amphipode nouveau de la famille des *Lysianassidae*. Mém. Soc. Zool. iv, pp. 6-10, 1 pl.
- CHILTON, CH. (1) Notes on the New Zealand *Squillidae*. Tr. N. Z. Inst. xxiii, pp. 58-68, 1 pl. Abstr. in N. Z. J. Sci. (n.s.) i. p. 34.  
5 species described, none new.
- (2) On the Changes in form of a parasitic Isopod (*Nerocila macleayi*). Tr. N. Z. Inst. xxiii, pp. 68-71, 1 pl. Abstr. in N. Z. J. Sci. (n.s.) i, p. 34.
- (3) On a new and peculiar Freshwater Isopod from Mount Kocsiusko [*Phreatoicus australis*, n. sp.]. Rec. Austral. Mus. i, pp. 149-171, 5 pls.
- (4) *Idothea lacustris*, G. M. Thomson. N. Z. J. Sci. (n.s.) i, p. 131.
- CLAUS, C. (1) Die Halocypriden des atlantischen Oceans und Mittelmeeres. Vienna: A. Holder, 1891, fol., 26 pls. (From Anz. Ak. Wien.)

- [CLAUS, C.] (2) Ueber den feineren Bau des Medianauges der Crustaceen. Anz. Ak. Wien, 1891, xii, pp. 124-127.
- (3) Ueber den feineren Bau der *Pontelliden*-Augen. *Op. cit.* xviii, pp. 182-184.
- (4) Die Gattungen und Arten der mediterranen und atlantischen *Halocypriden* nebst Bemerkungen über die Organisation derselben. Arb. z. Inst. Wien, ix, pp. 1-34. Abstr. J. R. Micr. Soc. 1891, p. 344. 6 new genera ; 12 new species.
- (5) Ueber *Goniopelte gracilis*, eine neue Peltidie. Arb. z. Inst. Wien, ix, pp. 151-162, 2 pls. Abstr. J. R. Micr. Soc. 1891, p. 594.
- (6) Das Medianauge der Crustaceen. Vienna : A. Hölder, 1891, 8vo, 4 pls. ; also Arb. z. Inst. Wien, ix, pp. 225-264.
- (7) Ueber das Verhalten des nervösen Endapparates an den Sinneshaaren der Crustaceen. Zool. Anz. xiv, pp. 363-368.
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- THOMSON, J. C. *Copepoda* as an Article of Food. *Nature*, xlv, p. 294.
- ULRICH, E. O. New and little known American Palæozoic *Ostracoda*. *J. Cincinn. Soc.* xiii, pp. 104-137 & 173-211, 8 pls.
- VÁVRA, V. (1) Ueber das Vorkommen einer Süßwasser-Cytheride (*Limnocythere stationis*, n. sp.) in Böhmen. *Zool. Anz.* xiv, p. 77.
- . (2) Monographie der Ostracoden Böhmens. Prague (Fr. Rivnáč): 1891, 8vo (from *Arch. naturw. Landesforsch. Böhmen*, viii).  
2 new species.
- . (3) Kritisches Verzeichniss der Ostracoden Böhmens. *SB. Böhm. Ges.* 1891, pp. 159-168.  
N. g. *Candonopsis*.
- VIALLANES, H. (1) Note relative à un travail de M. de Kerhervé sur les *Moïna*. *Bull. Soc. Z. Fr.* xvi, p. 129.
- . (2) Sur la structure de la lame ganglionnaire des Crustacés Décapodes. *T. c.* pp. 168-176.
- . (3) Sur la structure de l'œil composé des Crustacés macroures. *C.R.* cxii, pp. 1017-1019; *Rev. Sci.* xlvii, p. 633. *Abstr. J. R. Micr. Soc.* 1891, p. 468.
- VOELTZKOW, A. Vorläufiger Bericht über die Ergebnisse einer Untersuchung der Süßwasserfauna Madagascars. *Zool. Anz.* xiv, pp. 214-217 & 221-230.  
A few *Crustacea*.
- WALKER, A. O. (1) On *Pherusa fucicola*, Leach. *Ann. N. H.* (6) viii, pp. 81-83.  
Suggests *Apherusa* for *Pherusa*, Bate.
- . (2) On *Pherusa fucicola*, Leach. *Op. cit.* vii, pp. 418-422.  
The author finds the form falsely described, and thinks it should be discarded.
- WELDON, W. F. R. The Renal Organs of Certain Decapod *Crustacea*. *Q. J. Micr. Soc.* xxxii, pp. 279-291, 2 pls. *Abstr. J. R. Micr. Soc.* 1891, p. 467.
- WHEELER, W. M. Neuroblasts in the Arthropod Embryo. *J. Morph.* iv, pp. 337-343.
- WIEDERSHEIM, R. Abstract of his paper on Movements of the Brain of *Leptodora*. *J. R. Micr. Soc.* 1891, p. 188. [See *Zool. Rec.* xxvii, *Crust.* WIEDERSHEIM.]
- WRZĘSNIOWSKI, A. Abstract of his paper on subterranean *Gammaridae*. *J. R. Micr. Soc.* 1891, p. 37. [See *Zool. Rec.* xxvii, *Crust.*, WRZĘSNIOWSKI.]

## II.—SYSTEMATIC.

The general classification of the article *Crustacea* in the Encyclopædia Britannica has been followed.

## Subclass 1. THORACIPODA = MALACOSTRACA.

Legion 1. *PODOPHTHALMIA*.

## Order 1. DECAPODA.

Suborder (a) *BRACHYURA*.

*Epixanthus subcorrosus*, n. sp., DE MAN, Notes Leyd. Mus. xiii, p. 14, pl. i, fig. 3.

*Xantho?* *manzoni*, n. sp., RISTORI, Atti Soc. Tosc. ix, p. 213, pl. iv.

*Thalamita invicta*, n. sp., THALLWITZ, Abh. zool. Mus. Dresden, 1890-91, No. 3, p. 46.

*Ocypoda edwardsi*, n. sp. (near *O. fabricii*, Hilgendorf), from the Ile du Prince, OSORIO, J. Sci. Lisb. (2) ii, p. 48.

*Pelocarcinus marcheï* and *P. cailloti*, n. spp., from the Philippine Is., M. EDWARDS, N. Arch. Mus. (3) ii, pp. 173 & 174, pls. xii & xiii.

Suborder (b) *ANOMURA*.

*Cryptodromia stearnsii*, n. sp., IVES, P. Ac. Philad. 1891, p. 216, pl. xxii.

*Cancellus parfaiti*, n. sp., EDWARDS & BOUVIER, Bull. Soc. Philom. (8) iii, p. 70.

*Clibanarius formosus*, n. sp., IVES, P. Ac. Philad. 1891, p. 182, pl. v.

*Sympagurus nudus*, *S. gracilipes*, n. spp., EDWARDS & BOUVIER, Bull. Soc. Z. Fr. xvi, p. 131.

*Eupagurus ruticheles*, n. sp., *id. t. c.* p. 132.

*Pagurus vulnerans*, n. sp., THALLOWITZ, Abh. zool. Mus. Dresden, 1890-91, No. 3, p. 33.

*Eupagurus seriespinosus*, *E. brachiomastus*, n. spp., *id. t. c.* p. 34.

*Remipes celebensis*, *R. admirabilis*, n. spp., *id. t. c.* p. 35.

BOUVIER [Am. Sci. Nat. (7) xii, p. 65] arrives at the conclusion that the so-called *Glaucothoidæ* are in reality larval *Paguridæ*.

Suborder (c) *MACRURA*.

ORTMANN [Zool. Jahrb. v, pp. 693-750] revises the genus *Palæmon*. He finds many of the species of different authors to be identical.

*Palæmon euryrhyncus*, n. sp., ORTMANN, Zool. Jahrb. v, p. 738, pl. xlviii.

*Palæmon latidactylus*, *P. esculentus*, *P. dulcis*, n. spp., THALLWITZ, Abh. zool. Mus. Dresden, 1890-91, pp. 17-19.

*Leander maculatus*, n. sp., *id. t. c.* p. 19.

*Palæmonella yucatunica*, n. sp., IVES, P. Ac. Philad. 1891, p. 182, pl. v.

- Cymodacea bermudensis*, n. sp., *id. t. c.* p. 186, pl. vi.  
*Penacus gracilirostris*, n. sp., THALLOWITZ, Abh. zool. Mus. Dresden, 1890-91, No. 3, p. 3.  
*Pandulus stimpsoni*, n. sp., *id. t. c.* p. 3.  
<sup>†</sup>*Eualus*, n. g., *obses*, n. sp., *id. t. c.* p. 23.  
<sup>†</sup>*Helia*, n. g., to include *Hippolyte fabricii*, Kroyer, *id. t. c.* p. 24.  
<sup>†</sup>*Saron*, n. g., to include *Hippolyte gibberosus*, M. E., *id. t. c.* p. 24.  
*Atya dentiostriis*, n. sp., *id. t. c.* p. 26, fig. 7.  
*Callianassa novæ-guinææ*, n. sp., *id. t. c.* p. 31.  
*Coenobita compressa*, n. n. for *C. rugosa*, BOUVIER, Bull. Soc. Philom. (7) iii, p. 21.

## Order 2. STOMAPODA.

*Squilla polita*, *S. parva*, *S. panamensis*, *S. biformis*, n. spp., from the Pacific, BIGELOW, Johns Hopk. Univ. Circ. x, pp. 93 & 94.

## Legion 2. EDRIOPHTHALMIA.

## Order 3. ISOPODA.

- Phreatiocus australis*, n. sp., CHILTON, Rec. Austral. Mus. i, p. 149.  
*Mancasellus macrourus*, n. sp., GARMAN, Bull. Ess. Inst. xxii, p. 28.  
*Cirolana mayana*, n. sp., IVES, P. Ac. Philad. 1891, p. 186, pl. vi.

## Order 4. TRILOBITA.

[See *Arachnida*, *Gigantostraca*, p. 23.]

## Order 5. AMPHIPODA.

STEBBING (Tr. Z. S. xiii, p. 1) revises the genus *Urothoe*, under which he includes the following 8 species: *abbreviata*, *brevicornis*, *elegans*, *irros-tratus*, *marinus*, *norvegica*, *poucheti*, and *pulchella*.

<sup>†</sup>*Urothoides*, n. g., to receive *Urothoe lachneëssa*, Stebbing; STEBBING, *t. c.* p. 26.

*Sophrosyne robertsoni*, n. sp., STEBBING & ROBERTSON, *t. c.* p. 31, pl. v.

*Syrrhoë fimbriatus*, n. sp., *iid. t. c.* p. 34, pl. v.

*Podoceros palmatus*, n. sp., *iid. t. c.* p. 36, pl. vi.

*Podocerus cumbrensis*, n. sp., *iid. t. c.* p. 38, pl. vi.

*Podoprion bolivari*, n. sp., CHEVREUX, Mém. Soc. Zool. iv, p. 6.

<sup>†</sup>*Nannonyx*, n. g., to receive *Orchomene goëssii*, Boeck; SARS, Crust. of Norway, i, pl. iv, p. 72.

<sup>†</sup>*Orchomenopsis*, n. g., *obtusa*, n. sp., *id. t. c.* p. 72, pl. xxvi, fig. 2.

*Tryphosa angulata*, n. sp., *id. t. c.* p. 78, pl. xxviii, fig. 1.

<sup>†</sup>*Tryphosites*, n. g., to receive *Anonyx longipes* sp., Bate; *id. t. c.* p. 81.

<sup>†</sup>*Pseudotryphosa*, n. g., to receive *Ichnopus umbonatus*, Sars; *id. t. c.* p. 83.

<sup>†</sup>*Hoplonyx*, n. g., to receive several species hitherto attributed to *Anonyx* and the following n. spp.: *H. similis*, *H. acutus*, *H. albidus*, *H. leucophthalmus*, *H. caeculus*; *id. t. c.* pp. 91-98, pls. xxxiii-xxxv.

- ↓ *Centromedon*, n. g., to receive *Anonyx pumilus*, Lilljeborg; *id. t. c.* pl. v, p. 99.
- ↓ *Chironesimus*, n. g., to receive *Anonyx debruynei*, Hoek; *id. t. c.* p. 108.
- Kirguelenia borealis*, n. sp., *id. t. c.* p. 119, pl. xl, fig. 2.
- Bathyporeia norvegica*, *B. gracilis*, n. spp., *id. t. c.* pt. 6, pp. 128-132, pls. xliii & xlv.
- ↓ *Leptophoxus*, n. g., to receive *Phoxus falcatus*, Sars; *id. t. c.* pt. 7, p. 146.
- ↓ *Paraphoxus*, n. g., to receive *Phoxus oculatus*, Sars; *id. t. c.* p. 148.
- Harpinia neglecta*, *H. pectinata*, *H. propinqua*, *H. truncata*, *H. laevis*, n. spp., *id. t. c.* pp. 153-161, pls. liii-lvi.
- Ampelisca amblyops*, *A. pusilla*, n. spp., *id. t. c.* pt. 8, p. 180, pl. lxiii.
- Byblis longicornis*, *B. affinis*, n. spp., *id. t. c.* pt. 9, p. 185, pl. lxv.
- Haploops robusta*, n. sp., *id. t. c.* p. 195, pl. lxviii, fig. 2.
- Stegocephalus similis*, n. sp., *id. t. c.* p. 200, pl. lxx, fig. 1.
- ↓ *Stegocephaloides*, n. g. = *Stegocephalus* in part; *id. t. c.* p. 202.
- ↓ *Aspidopleurus*, n. g., to receive *Stegocephalus gibbosus*, Sars; *id. t. c.* p. 203.
- ↓ *Audaniopsis*, n. g., to receive *Audania nordlandica*, Boeck; *id. t. c.* p. 208.
- ↓ *Audaniella*, n. g., to receive *Audania pectinata*, Sars; *id. t. c.* p. 211.
- Melita cotesi*, n. sp., GILES, J. A. S. B. lix, pt. 2, p. 64, pl. ii, fig. 1.
- Phoxus uncistrostratus*, n. sp., *id. t. c.* p. 65, pl. ii, fig. 2.
- Ampelisca daleyi*, n. sp., *id. t. c.* p. 66, pl. ii, fig. 3.
- Lysianassa wood-masoni*, n. sp., *id. t. c.* p. 68, pl. ii, fig. 4.
- Anonyx indicus*, n. sp., *id. t. c.* p. 69, pl. ii, fig. 5.
- Parapleustes pictus*, n. sp., *id. t. c.* p. 70, pl. ii, fig. 6.
- Cyrtophium andamanense*, n. sp., *id. t. c.* p. 72, pl. ii, fig. 7.
- Talorchestia brito*, n. sp., STEBBING, Ann. N. H. (6) viii, p. 325, pl. xv.
- Leptognathia lilljeborgi*, n. sp., *id. t. c.* p. 328, pl. xvi.

## Subclass 2. GNATHOPODA = ENTOMOSTRACA.

### Legion 4. BRANCHIOPODA.

#### Order 8. PHYLLOPODA.

*Saccocaris minor*, n. sp., ETHERIDGE, WOODWARD, & JONES, Rep. Brit. Ass. lx, p. 424, fig. 1.

*Estheria youngii*, *E. tessellata*, *E. tegulata*, n. spp., Scotch Carboniferous *Estheria*, Tr. Geol. Soc. Glasgow, ix, pl. 5.

### Legion 5. LOPHYROPODA.

#### Order 10. OSTRACODA.

*Ctenobolbina alata*, *C. tumida*, *C. bispinosa*, *C. punctata*, *C. informis*, *C. minima*, *C. papillosa*, *C. antespinoza*, n. spp., ULRICH, J. Cincinn. Soc. xiii, pp. 110 & 186-188, pls. vii, xii, & xv.

*Primitia perminima*, *P. (?) sculptilis*, *P. nitida*, *P. centralis*, *P. impressa*, *P. medialis*, *P. rudis*, *P. glabra*, *P. nodosa*, *P. milleri*, *P. granimarginata*, *P. subequata*, n. spp., *id. t. c.* pp. 130-136 & 202, pls. vii, viii, x, & xiv.



*Jonesella pedigera*, *J. digitata*, *J. crassa*, n. spp., *id. t. c.* pp. 121 & 122, pl. vii.

*Entomis madisonensis*, *E. waldronensis*, n. spp., *id. t. c.* pp. 107 & 183, pls. vii & xii.

*Drepanella crassinoda*, *D. ampla*, *D. macer*, n. spp., *id. t. c.* pp. 118-121, pl. viii.

*Eurychilina subradiata*, *E. longula*, *E. æqualis*, *E. granosa*, *E. obesa*, n. spp., *id. t. c.* pp. 126-129, pl. ix.

*Placentula marginata*, *P. inornata*, n. spp., *id. t. c.* p. 124, pl. x.

*Pontocypris* (?) *illinoisensis*, *P.* (?) *acuminata*, n. spp., *id. t. c.* pp. 107 & 210, pls. x & xvii.

*Leperditia linneyi*, *L. tumidula*, *L. appressa*, *L.* (?) *subrotunda*, *L. nicklesi*, n. spp., *id. t. c.* pp. 174-176, 181, & 200, pls. xi, xvi, & xviii.

*Isochilina subnodosa*, *I. ampla*, *I. saffordi*, *I. kentuckyensis*, *I. amiana*, *I. rectangularis*, n. spp., *id. t. c.* pp. 177-182, pls. xi & xvi.

*Bollia pumila*, *B. granifera*, n. spp., *id. t. c.* pp. 117 & 205, pl. xii.

*Octonaria curta*, *O. ovata*, *O. clavigera*, *O. stigmata*, n. spp., *id. t. c.* pp. 193-195, pls. xii & xvi.

*Beyrichia tricolina*, *B. lyoni*, *B. simulatrix*, n. spp., *id. t. c.* pp. 189 & 204, pls. xii, xiv, & xviii.

*Æchmina abnormis*, *Æ. marginata*, n. spp., *id. t. c.* p. 183, pls. xii & xvi.

*Moorea granosa*, *M. bicornuta*, n. spp., *id. t. c.* pp. 191 & 206, pls. xii & xvi.

*Utrichia emarginata*, *U. confluens*, n. spp., *id. t. c.* p. 203, pl. xii.

✓ *Barychilina*, n. g., with n. spp. *punctostriata* and *pulchella*, *id. t. c.* p. 199, pl. xiii.

✓ *Pachydomella*, n. g. *tumida*, n. sp., *id. t. c.* p. 198, pl. xiii.

*Cypridina herzeri*, n. sp., *id. t. c.* p. 209, pl. xiv.

*Kirkbya subquadrata*, *K. parallela*, *K. semimuralis*, *K. venosa*, *K. lindahli*, n. spp., *id. t. c.* pp. 192 & 208, pls. xv & xviii.

✓ *Halliella retifera*, n. g. & sp., *id. t. c.* p. 185, pl. xv.

*Aparchites inornatus*, n. sp., *id. t. c.* p. 182, pl. xvi.

*Bythocypris indianensis*, *B. devonica*, *B. punctulata*, n. spp., *id. t. c.* pp. 196 & 197, pls. xvi & xvii.

*Cytherella ovatiformis*, n. sp., *id. t. c.* p. 209, pl. xvii.

*Bairdia leguminoides*, *B. cestriensis*, n. spp., *id. t. c.* pp. 197 & 210, pl. xvii.

*Paradoxostoma inflexum*, n. sp., NORMAN, Ann. N. H. (6) vii, p. 118.

*Limnocythere stationis*, n. sp., VAVRA, Zool. Anz. xiv, p. 77.

✓ *Candonopsis*, n. g., to contain *Candona kingsleii*, Brady & Robertson; *id.* SB. Böhm. Ges. 1891, and Arch. naturw. Landesforsch. Böhmen, viii, p. 54, fig. 16.

*Cypridopsis smaragdina*, n. sp., *id.* SB. Böhm. Ges. 1891, p. 168, and Arch. naturw. Landesforsch. Böhmen, viii, p. 80, fig. 26.

*Cypris weberi*, *C. richardi*, *C. odiosa*, *C. sarsi*, *C. longiseta*, n. spp., MONIEZ, Zool. Ergebn. e. Reise in Niederl. Ost-Ind. ii, p. 129, pl. x, from Celebes.

*Cyprinotus pyxidatus*, n. sp., *id. t. c.* p. 134, pl. x.

† *Microconchæcia*, n. g., to receive *Halocypris clausii*, Sars; CLAUS, Die Halocypriden des atlantischen Oceans, p. 73.

*Conchæcia subarcuata*, *C. spinosa*, *C. hyalophyllum*, *C. porrecta*, *C. striata*, n. spp., *id. Arb. z. Inst. Wien*, ix, pp. 9-13.

† *Paraconchæcia*, n. g., with n. spp. *oblonga*, *spinifera*, *inermis*, and *gracilis*, *id. t. c.* pp. 13-16.

† *Conchæcetta*, n. g., *acuminata*, n. sp., *id. t. c.* p. 16.

† *Conchæcilla*, n. g., *daphnoides*, n. sp., *id. t. c.* p. 17.

† *Conchæcissa*, n. g., *armata*, n. sp., *id. t. c.* p. 18.

† *Pseudconchæcia*, n. g., to receive *Conchæcia serrulata*, Claus, *id. t. c.* p. 20.

† *Mikroconchæcia*, n. g., to receive *Halocypris clausii*, Sars., *id. t. c.* p. 22.

*Halocypris pelagica*, *H. distincta*, n. spp., *id. t. c.* p. 25.

#### Order 11. COPEPODA.

SCHMEIL (*Z. Naturw.* lxiv, p. 1) gives a useful general account of the Freshwater *Copepoda* of Germany. Pp. 22-36 are occupied with short diagnoses of all the well-established German *Cyclopidae*.

IMHOFF (*Biol. Centralbl.* xi, p. 356) enumerates the 23 known species of *Canthocamptus*, of which 18 are European.

*Cyclops gracillicornis* and *C. dybowskii*, n. spp., LANDE, Pam. Fizjogr. x, pp. 345 & 363, pls. xv-xvii.

*Diaptomus unguiculatus*, *D. transylvanicus*, *D. spinosus*, n. spp., DADAY, Term. füzetek, xiii, pp. 118-130, pl. iv.

*Diaptomus galebi*, *D. lorteti*, *D. ægyptiacus*, n. spp., from Cairo, BARROIS, Rev. Biol. iii, pp. 230, 277, & 316.

*Diaptomus deitersi*, n. sp., from Brazil, POPPE, Zool. Anz. xiv, p. 248, 3 figs.

*Branchiella chavesi*, *B. chevreuxi*, n. spp., VAN BENEDEN, Bull. Ac. Belg. (3) xxii, pp. 24 & 29, pls. i & ii.

*Dactylopus bahamensis*, n. sp., C. L. EDWARDS, Arch. f. Nat. lvii, p. 77, pl. iii, figs. 1-15.

† *Esola*, n. g., *longicauda*, n. sp., *id. t. c.* p. 81, pl. iii, figs. 16-26.

† *Rapidophorus*, n. g., *wilsoni*, n. sp., *id. t. c.* p. 84, pl. iv, figs. 1-11.

† *Diogenidium*, n. g., *nasutum*, n. sp., *id. t. c.* p. 87, pl. iv, figs. 12-19.

† *Abacola*, n. g., *holothuria*, n. sp., *id. t. c.* p. 92, pl. v, figs. 1-17.

† *Leuckartella*, n. g., *paradoxa*, n. sp., *id. t. c.* p. 96, pl. v, figs. 18 & 19.

† *Mormonilla*, n. g., with n. spp. *M. phasma* and *M. minor*, GIESBRECHT, Atti [Mem. Rend.] Ac. Rom. vii, p. 474.

*Oithona linearis*, *O. robusta*, *O. brevicornis*, *O. hebes*, n. spp., *id. t. c.* p. 475.

† *Ægisthus*, n. g., with n. spp. *A. mucronatus* and *A. aculeatus*, *id. t. c.* p. 476.

*Microstella brevifida*, n. sp., *id. ibid.*

*Monstrilla grandis*, n. sp., *id. ibid.*

*Oncœa notopus*, *O. media*, *O. concifera*, *O. ornata*, *O. tenuimana*, *O. dentipes*, n. spp., *id. t. c.* pp. 476 & 477.

† *Conœa rapax*, n. g. & sp., *id. t. c.* p. 477.

*Lubbockia aculeata*, n. sp., *id. ibid.*

*Pachysoma tuberosum*, n. sp., *id. t. c.* p. 478.

*Sapphirina aureofurca*, *S. stellata*, *S. scarlata*, *S. intestinata*, *S. gastrica*, *S. bicuspidata*, *S. vorax*, n. spp., *id. ibid.*

† *Corina granulosa*, n. g. & sp., *id. t. c.* p. 479.

*Copilia lata*, *C. oblonga*, *C. elliptica*, *C. recta*, n. spp., *id. ibid.*

*Corycæus robustus*, *C. danæ*, *C. flaceus*, *C. alatus*, *C. gracilicauda*, *C. tenuis*, *C. lubbockii*, *C. carinatus*, *C. gibbulus*, n. spp., *id. t. c.* pp. 480 & 481.

*Lichomolgus poucheti*, n. sp., CANU, Bull. Sci. Fr. Belg. xxiii, p. 478.

*Herrmannella rostrata*, n. sp., *id. t. c.* p. 480.

*Pseudanthessius sauvagei*, n. sp., *id. t. c.* p. 481.

*Clytemnestra hendorffi*, n. sp., POPPE, Abh. Ver. Brem. xii, p. 132, pl. i.

*Splanchnotrophus willemi*, n. sp., CANU, C.R. cxiii, p. 435.

*Argulus melita*, n. sp., VAN BENEDEN, Bull. Ac. Belg. xxii, p. 369.

### Legion 6. ANCHORACEPHALA.

#### Order 13. CIRRHIPEDIA.

*Scalpellum calcariferum*, n. sp., FISCHER, Bull. Soc. Z. Fr. xvi, p. 117.

*Scalpellum stearnsii*, n. sp., from Japan, PILSBURY, P. Ac. Philad. 1890, p. 441.

*Cirrhipedes pedunculatus laciniatus*, n. sp., HESSE, Ann. Sci. Nat. xi, p. 180, pl. v.

### III.—MORPHOLOGY.

#### General.

For an account of the general structure of the *Halocypridæ*, see CLAUS, Arb. z. Inst. Wien, ix, p. 126.

MONIEZ (C.R. cxii, p. 669) finds that collections from all parts of the world indicate that males of *Cypris* and allied genera are far more common than appears to be the case in European waters. Moreover, he finds no support for the belief that the production of males is influenced by the season of the year or the degree of saltiness of the water.

In his monograph on Bohemian *Ostracoda*, VÁVRA gives a brief account of the anatomy of this group on pp. 9–25.

EDWARDS & BOUVIER (Bull. Soc. Philom. iii, p. 102) consider it established that the *Paguridæ* of the deep sea resemble ancestral forms, and this resemblance decreases progressively as the coasts are approached.

#### *Habits and Abnormalities.*

HERRICK (1) recounts some observations on the habits of the American lobster. Eggs are laid during July and August, and they take from six

to eight weeks to hatch. After sexual maturity, moulting is probably not annual. Young lobsters swim at the surface for six weeks.

EDWARDS & BOUVIER (Bull. Soc. Philom. iii, p. 151) discuss the case of a *Paguristes* found inhabiting the left-handed spiral shell of *Sinistralia maroccana*. The example in question was modified to suit its dwelling, though it belonged to a genus normally asymmetrical and inhabiting right-handed shells.

For various observations on the habits and morphology of the *Paguridæ*, see BOUVIER.

ISHIKAWA has examined twenty males of *Gebia major*, and found that in all of them the hinder part of the testis was ovary-like in appearance, and contained egg cells of large size. These are not passed out, but they appear to be absorbed at certain seasons of the year.

ISCHIKAWA describes the occurrence of ova in the testes of *Gebia major*. Zool. Anz. xiv, p. 70.

BENHAM (Ann. N. H. (7) vii, p. 256) notices a case of the doubling of the female generative pores in *Astacus fluviatilis*, and of asymmetry of the generative pores in *Lumbricus herculeus*.

### *Sense Organs.*

VIALLANES (Bull. Soc. Z. Fr. xvi, p. 168) in a preliminary account of the minute structure of the eye of *Palinurus vulgaris*, controverts the views of Hickson, which are based, he thinks, on results obtained by imperfect methods.

SZCZAWINSKA (Arch. Biol. x, p. 523) has investigated the structure of the eyes in certain *Crustacea*. His results lead him to regard the eyes of *Branchippus*, *Gammarus*, or *Astacus* not as compound, but as simple eyes with specially differentiated cornea and regularly grouped pigment cells. Movements of the pigment cells adapt the eye to varying degrees of light.

VOM RATH finds sensory hairs on almost every portion of the Crustacean body. The most complicated and important are on the first antennæ. The function of these dermal sense organs is possibly quite distinct from any of our own senses. Zool. Anz. xiv, p. 195.

PARKER (Bull. Mus. C. Z. xxi, p. 45) publishes in considerable detail the results of his researches on the compound eyes of *Crustacea*. He recognizes three retinal types. In *Isopoda*, *Branchiopoda*, *Decapoda*, etc., the hypodermis simply thickens to form the retina. In *Apusidæ*, *Estheridæ*, and *Cladocera*, the ectodermal thickening invaginates—the pocket closing in the case of the *Cladocera*, but remaining permanently open in the other two forms. In *Amphipoda* and *Copepoda* the hypodermal thickening separates into the cornea and the retina. The author derives a type from which the ommatidia of all *Crustacea* might be supposed to be developed. It bears considerable resemblance to the actual structure of the eye of *Gammarus*.

CLAUS (Arb. z. Inst. Wien, lx, pp. 225-264) has an important article on the median Crustacean Eye. The subject is dealt with under the follow-

ing groups :—*Ostracoda*, p. 229; *Branchiopoda*, p. 236; *Cladocera*, p. 242; *Argulidae*, p. 244; *Copepoda*, p. 245; *Cirripedia*, p. 252.

VIALLANES (C.R. cxii, p. 1017), after investigating the compound eyes of *Macrura*, comes to conclusions somewhat at variance with those of Patten. He believes the cone to be simply an organ of refraction. The segments of the cone are not continuous with the rhabdoms, but are connected by filaments with the basal membrane.

### *Respiratory Organs and Appendages.*

BOUVIER (Ann. Sci. Nat. (7) p. 402) discusses the gills of the *Paguridae*. NUSBAUM deals with the locomotor appendages of *Isopoda*.

### *Vascular System.*

SCHNEIDER (C.R. cxiii, p. 316) has investigated the arterial system of *Isopoda*. His researches go to show that instead of having an anomalous and unique arrangement of vessels, as had been previously supposed, their arterial system strongly resembles that of the *Amphipoda*.

BOUVIER (Ann. Sci. Nat. (7) xi, p. 197) has investigated the vascular system in *Decapoda*. The antennary arteries always supply the eyes, and, in *Brachyura*, the rostrum, in conjunction with the ophthalmic artery. The liver derives its chief nourishment from the superior abdominal artery. The symmetry of the superior and inferior abdominal artery with their anastomoses is greatly destroyed in the *Brachyura*. The *Decapoda* resemble the *Isopoda* more than any other group in their arterial system.

### *Nervous System.*

RICHARD (Bull. Soc. Z. Fr. xv, p. 212) gives a detailed account of the nervous system in *Diaptomus*, as determined by the examination of several species of that genus.

\*RETZIUS deals with the nervous system of *Crustacea*.

SAMASSA (Arch. mikr. Anat. xxxviii, p. 100) has investigated the nervous system of the *Cladocera*. The types studied were *Sida crystallina*, *Daphnia sima*, *Bythotrephes longimanus*, and *Leptodora hyalina*. A useful bibliography of the subject will be found on p. 129.

### *Renal Organs.*

WELDON has discovered in several other forms the enormous bladder development which he first observed in *Palæmon serratus* (J. Mar. Biol. Ass. (n.s.) i, p. 162). He arrives at the conclusion that "the nephro-peritoneal sacs of the *Decapoda* should be regarded rather as enlarged portions of a tubular system, such as that found in *Mysis* and in the *Thalassinidae*, than as persistent remnants of a 'coelomic' body-cavity, into which tubular nephridia open." (Q. J. Micr. Soc. xxxii, p. 279.)

*Generation and Development.*

CANÓ (MT. z. Stat. Neap. ix, p. 483) gives a full account of his investigations of the female reproductive organs in *Decapoda*. He also discusses the cement glands, and the manner in which the eggs are attached in the various Decapod groups.

LEICHMANN (Bibl. Zool. x) has studied the reproduction of *Isopoda*. The *Sphaeromida* show rudimentary traces of hermaphroditism. In *Asellus* and *Sphaeroma* the ova are fertilised in the ovary itself. The formation of two polar bodies is noted, and the structure of the brood-chamber described. Leichmann finds, in the *Sphaeromida*, eight sacs, formed by invagination of the skin, in which the further development of the eggs takes place. They apparently furnish a nutritive fluid, as the yolk is insufficient to account for the size of the larva.

ROULE (C.R. cxiii, p. 153) has investigated the development of the mesoderm in *Porcellio scaber* and *Palæmon serratus*.

LEBEDINSKÝ describes the development of *Daphnia similis* from the summer egg.

In his account of the semi-parasitic *Copepoda* of Boulogne, CANU treats of the sexual dimorphism, the development, and the relations of the ascidicolous genera; Bull. Sci. Fr. Belg. xxiii, p. 467.

BUMPAS (J. Morph. v, p. 215) gives a detailed account of the development of American Lobster, illustrated by six good plates.

BUTSCHINSKY (Zapiski novoross. Obsch. Estestv. xiv, p. 79) has investigated the development of *Parapodopsus cornuta*.

See also CANO, NUSBAUM, ROULE, WHEELER.

## IV.—PHYSIOLOGY.

The renal secretion in *Crustacea*, as shown by the study of *Nika edulis*, *Alpheus ruber*, and *Caridina desmarestii*, is a true secretion, and not merely a filtration. The walls of the bladder take an active part in the excretory process; MARCHAL, C.R. cxiii, p. 223. See also WELDON.

FRITSCH treats of the coloration of *Holopedium gibberosum*.

GRIFFITHS describes his researches on the blood of *Invertebrata*; P. R. Soc. Edinb. xviii, p. 288.

BONNIER (C.R. cxiii, p. 808) discusses the antennary gland in the *Orchestiida*, and GROBBEN (SB. Ak. Wien, xcix, p. 539) in *Lucifer*.

For the minute structure of the Crustacean eye, see CLAUS, (2, 3, 6), also VIALLANES (3); and for the histology of the eye of the Lobster, see PARKER and SZCZAWINSKA.

GOGOZA describes experiments on the influence of freshwater on marine animals.

DEMOOR has investigated the mode of progression among *Crustacea*, and the nerve-centres which govern it.

On locomotion, see also GAUBERT.

For the function of the palps, see PLATEAU.

BUTSCHLI & SCHEWIAKOFF (Biol. Centralbl. xi, p. 33) have investigated the minute structure of Arthropod striated muscle.

## V.—GEOGRAPHICAL DISTRIBUTION.

*General.*

DE GUERNE & RICHARD (Bull. Soc. Z. Fr. xvi, p. 213) deal with the geographical distribution of *Diaptomus alluardi*; and VON IHERING with that of freshwater *Entomostraca* generally.

IMHOF (Biol. Centralbl. xi, p. 356) treats of the distribution of *Canthocamptus*.

ORTMANN (Zool. Jahrb. v, p. 744) treats of the geographical distribution of the genus *Palæmon*.

*European.*

For French species of the Isopod genus *Armadillidium* see DOLLFUSS, Feuille. Nat. xxii, p. 15.

CANU (Bull. Sci. Fr. Belg. xxiii, p. 467) continues his account of the *Copepoda* of the neighbourhood of Boulogne.

BOUVIER treats of the Pagurians of the French and Norwegian coasts. See also HESSE.

GOURRET deals with the *Lemodipoda* and *Isopoda* of the Gulf of Marseilles.

For the *Entomostraca* of the Department of the Gironde, see DE GUERNE & RICHARD, Bull. Soc. Z. Fr. xvi, p. 112. The list includes 3 *Copepoda*, 1 Ostracod, and 15 *Cladocera*, none of which are new.

For *Ostracoda* from Norway, see NORMAN; for *Amphipoda*, SARS.

BOLIVAR (An. Soc. Esp. xix, p. 115) gives a list of *Crustacea* of the neighbourhood of San Sebastian.

For Polish *Copepoda*, see LANDÉ.

For *Entomostraca* of Lake Balaton, see RICHARD.

For German freshwater *Copepoda*, see SCHMEIL.

THALLWITZ treats of the *Entomostraca* from the neighbourhood of Dresden, and of the German freshwater *Calanida*.

VÁVRA publishes a monograph on Bohemian *Ostracoda*.

For *Crustacea* of the Black Forest Lakes, see IMHOF, Zool. Anz. xiv, p. 33.

DADAY records several Hungarian *Crustacea* (Term. füzetek, xiv, p. 107). He reviews the genus *Diaptomus*, as found in Hungary, in vol. xiii, pp. 114-143.

For Scottish *Entomostraca*, see SCOTT.

*African and Asiatic.*

*Entomostraca* from Madagascar, DE GUERNE & RICHARD; also VOELTZKOW.

For E. African *Crustacea*, see HILGENDORF, S.B. nat. Fr. 1891, p. 18.

For some Indian *Amphipoda*, see GILES.

*Arthropoda* from Japan, IVES, P. Ac. Philad. 1891, p. 210.

Russian and Siberian *Entomostraca*, DE GUERNE & RICHARD, Bull. Soc. Z. Fr. xvi, p. 232.

For *Entomostraca* from Celebes, see MONIEZ & RICHARD.

*American.*

*Paguridæ* of the Gulf of Mexico ; EDWARDS & BOUVIER, Bull. Soc. Philom. iii, p. 102.

*Crustacea* from Yucatan, Florida, and Bermudas ; IVES.

MARSH gives a list of *Crustacea* from Green Lake, Wisconsin.

For American palæozoic *Ostracoda*, see ULRICH.

Microscopic Argentine *Crustacea* ; FRENZEL.

*Australasian and Oceanic.*

For some New Zealand *Squillidæ*, see CHILTON.

THOMSON records some *Crustacea* from dried New Zealand mud.

CLAUS publishes a monograph on the *Halocypridæ* of the Atlantic Ocean.

*Paguridæ* from the Azores ; EDWARDS & BOUVIER, Bull. Soc. Z. Fr. xvi, p. 131.



# ARACHNIDA.

BY

R. INNES POCKOCK.

## ARRANGEMENT OF RECORD.

ARACHNIDA (s.s.), pp. 1-26.	ACARI, pp. 19-22.
Titles of anatomical, physiological, biological, &c., papers, p. 1.	Titles, p. 19.
Titles of systematic and faunistic papers, p. 3.	Systematic, p. 20.
Palæontology, p. 5.	PENTASTOMIDA, p. 23
Systematic, p. 6.	GIGANTOSTRACA, p. 23.
Scorpiones, p. 6.	PANTOPODA, p. 25.
Solifugæ, p. 7.	
Araucæ, p. 8.	

## TITLES OF PAPERS\*

ON ANATOMY, PHYSIOLOGY, EMBRYOLOGY, HABITS, MIMICRY, ETC.,  
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1891, pp. 1-4.

\*BERTEAUX, L. Le poumon des Arachnides. Cellule, v, pp. 255-317.

BERTKAU, PH. (1) Beschreibung eines Arthropoden-zwitters. Arch.,  
Nat. lvii, pp. 229-238.

Notice of hermaphrodite *Lycosa*.

——. (2) Das Weibchen einer vierten deutschen *Atypus*-Art. SB. Ver.  
Rheinl. xlvii, pp. 76-78 (1890).

——. (3) Zur Entwicklungsgeschichte der Pseudoscorpione. CB. Ver.  
Rheinl. 1891, pp. 45 & 46.

——. (4) Ueber das Vorkommen einer Giftspinne (*Chiracanthium nutrita*,  
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\* An asterisk prefixed to a quotation indicates that the Recorder has not seen the Journal or Work referred to.

- BIRULA, A. Einiger über den Mitteldarm der Galeodiden. *Biol. Centralbl.* xi, pp. 295-300.
- BRONGNIART, C., & GAUBERT, P. Fonctions de l'organe pectiniforme des Scorpions. *C.R.* cxiii, pp. 1062 & 1063.
- CADOGAN-MASTERMAN, G. Gregarious Spiders. *Sci. Goss.* 1891, pp. 1 & 2.
- DEMOOR, J. Recherches expérimentales sur la locomotion des Arthropodes. *C.R.* cxi, No. 22, pp. 839 & 840 (1890).
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- . (2) Notes on the Poisonous Bite of *Lathrodectus scelio*. *Op. cit.* vii, pp. 140-143.
- GAUBERT, P. (1) Sur la locomotion des Arthropodes. *Bull. Soc. Philom.* (8) iii, No. 1, pp. 5-7.
- . (2) Note sur les organes lyriformes des Arachnides. *T. c.* pp. 14-16.
- . (3) Sur la structure des glandes venimeuses des Aranéides. *Op. cit.* No. 2, p. 82.
- . (4) Glandes patellaires des Aranéides. *Op. cit.* No. 3, p. 134.
- . (5). Sur les glandes observées chez certaines *Theraphosidae*. *C.R. Soc. Philom.* 1891, No. 16, p. 3.
- . (6) Note sur un nouvel organe des sens et sur les racquettes coxales des *Galeodes*. *Bull. Soc. Z. Fr.* xvi, pp. 211 & 212.
- HECKEL, ED. Sur le mimétisme du *Thomisus onustus*, Walck. *Bull. Sci. Nord.* xxiii, pp. 347-354, 2 pls.
- JAWAROWSKI, A. Ueber die Extremitäten bei den Embryonen der Arachniden und Insecten. *Zool. Anz.* xiv, No. 363, pp. 164-169, and No. 364, pp. 174-176.
- KISHINOUE, K. The Lateral Eyes of Spiders. *T. c.* pp. 381-383.
- \*LAMEERE, A. Sur l'unité d'origine du type Arthropode. *C.R. Ent. Belg.* iv, No. 9, pp. cxxv & cxxvi.
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- \*SAINT-REMY, J. Contribution à l'étude du cerveau chez les Arthropodes tracheates. Poitiers : 1890. *Abstr. Rev. Sci.* xvi, No. 23, p. 725.
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- "S. J." Propulsion of Silk by Spiders. *Nature*, xlv, p. 30.
- SMITH, W. W. Further Notes on *Nemesia gilliesii*. *N. Z. J. Sci.* i, pp. 101-103.
- STEFANOWSKI, M. La disposition histologique du pigment dans les yeux des Arthropodes sous l'influence de la lumière directe et de l'obscurité complète. *Rec. Z. Suisse*, v, No. 2, pp. 151-200.
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- \*VARIGNY, H. DE. À propos du vol des Araignées. *T. c.* pp. 633 & 634.
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- WALSH, J. TULL. On certain Spiders which mimic Ants. *J. A. S. B.* 1891, No. 1, pp. 1-4.
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——. (2) Lijst van Spinnen door Dr. A. M. J. Bolsius verzameld te Soemenap op het eiland Madoera. T. c. pp. 354-360.

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- . (2) Descriptions de deux espèces nouvelles d'Arachnides recueillis dans le Sahara par le Dr. R. Blanchard. Bull. Soc. Z. Fr. xvi, pp. 198 & 199.
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- . (4) Descriptions d'espèces et de genres nouveaux de la famille des *Aviculariidae*. T. c. pp. 300-312.
- . (5) Liste des Arachnides recueillis par M. Ch. Rabot dans la Sibérie Occidentale en 1890. Bull. Soc. Z. Fr. xvi, pp. 107-109.
- . (6) Descriptions de quelques Arachnides du Costa Rica, communiqués par M. A. Getaz (de Genève). T. c. pp. 109-112.
- . (7) [*Vide* HASSELT (3).]
- . (8) On the Spiders of the Island of St. Vincent. P. Z. S. 1891, pp. 549-575, pl. xlii.
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## PALÆONTOLOGY.

<sup>1</sup>*Trimeropus*, n. g., for *Lycosoides*, Gourret, nom. preocc. p. 60 (in note); THORELL (1).

HAASE gives a revision of fossil *Arachnida*, characterising all the orders, suborders, and families. The *Anthracomarti* are referred to the *Opiliones*, which further contain the new suborder *Phalangiotarbi*, for the new genus *Phalangiotarbus*. In the second part of his work he constitutes a new family of *Pedipalpi*, allied to the *Palpigradi*, for the reception of a new genus, *Sternarthron*, which is established upon the fossils referred by Oppenheim to the Orthopterous genus *Chresmodes*. One new species, *Sternarthron zittelii*.

## RECENT FORMS.

## SCORPIONES.

PROF. KRAEPELIN divides the *Buthidae* into three subfamilies: the *Isometrini*, for *Isometrus* and *Phassus*; the *Centrurini*, for *Centrurus*; and the *Androctonini*, for the rest.

Synopsis of the genera of the *Androctonini*, pp. 13-15; of the *Isometrini* and *Centrurini*, pp. 16 & 17.

*Androctonus*, p. 31, *funestus* (Ehrb.), N. Africa, pp. 32 & 33; *crassicauda* (Oliv.), N. Africa, Persia, pp. 33 & 34.

*Buthus*, pp. 35-41, synopsis of the species, pp. 41 & 42, *hottentotta* (Fabr.), syn. *judaicus*, *nigrocarinatus*, *conspersus*, *martensii*, *sauleyi*, *dimidiatus*, *acute-carinatus*, *socotrensis*, Africa, India, pp. 43-51; *gibbosus* (Brullé), syn. *confucius* (Sim.), Europe, Persia, China, pp. 51-54; *occitanus* (Am.), Mediterranean, pp. 54-57; *dorici* (Thor.), Persia, pp. 57 & 58; *5-striatus* (Ehrb.), syn. *beccarii* (Sim.), N. Africa, pp. 58-60; *leptochelys* (Ehrb.), N. Africa, pp. 60 & 61.

*Heterobuthus*, n. g., pp. 63-67; *liosoma* (Ehrb.), with so-called synonyms, Africa, Arabia, pp. 68 & 69; *brevimanus* (Thor.), S. Africa, p. 69.

*Grosphus*, p. 70, *piceus* (Pocock), syn. *lobidens* (Pocock), Madagascar, pp. 70-72; *limbatus* (Pocock), Madagascar, pp. 72 & 73.

*Orthodactylus*, p. 73; *schneideri* (L. Koch), Mediterranean, pp. 73-75.

*Butheolus*, p. 75.

*Archisometrus*, n. g., p. 75, synopsis, pp. 76-78; *basilicus* (Karsch), p. 78; *weberi* (Karsch), syn. *mesor*, *phipsoni*, E. Indies, pp. 79 & 80; *flavimanus* (Thor.), Sumatra, p. 80; *burdoi* (Sim.), E. Africa, pp. 80 & 81; *curvidigitus* (Gerv.), syn. *armillatus*, *varius*, *chinensis*, *atomarius*, E. Indies, pp. 81-83; *shoplandi* (Oates), Burma, p. 83; *marmoreus* (C. Koch), syn. *variatus*, *thorellii*, *perfidus*, Australia, pp. 84 & 85; *tricarinatus* (Sim.), Pondicherry, E. Africa, pp. 79 & 80.

*Tityus*, pp. 87 & 88, synopsis of species, p. 88; *lineatus* (C. Koch), pp. 89 & 90.

*Tityolepreus*, n. g., p. 90, *chinchoxensis* (Karsch), W. Africa, pp. 90-92.

*Lepreus*, p. 92, synopsis of species, p. 93; *pilosus*, Thor., Caffraria, p. 94; *planimanus*, Karsch, syn. *lunulifer*, Caffraria, pp. 94 & 95; *otjimbinguensis* (Karsch), Damaraland, p. 95; *vittatus* (Thor.), syn. *fischeri*, Karsch, Africa, pp. 95 & 96.

*Rhoptrurus*, syn. *Babycurus*, pp. 96-99, *dentatus*, Karsch, E. Africa, pp. 99 & 100; *büttneri* (Karsch), syn. *centrurimorphus*, Africa, p. 101.

*Isometrus*, pp. 102 & 103; *maculatus* (de Geer), tropical countries, pp. 103-106; *melanodactylus*, L. Koch, Australia, pp. 106 & 107.

*Phassus*, Thor., pp. 107 & 108, synopsis of species, pp. 108 & 109; *fuscus* (Thor.), Cordova, pp. 109 & 110; *columbianus*, Thor., S. America, pp. 110 & 111; *crassimanus* (Thor.), Mexico, pp. 111 & 112; *americanus* (Linn.), syn. *gervaisii*, *costatus*, *americus*, pp. 112-116; *stigmurus* (Thor.), Brazil, pp. 116 & 117; *bahiensis* (Perty), Brazil, pp. 117 & 118.

*Centrurus*, pp. 119 & 120, synopsis of species, pp. 120 & 121 ; *thorellii*, n. sp., Guatemala, pp. 124 & 125 ; *infamatus* (C. K.), syn. *elegans*, *limpidus*, N. & S. America, pp. 125-127 ; *insulanus*, Thor., Jamaica, p. 127 ; *granosus*, Thor., syn. *bertholdi*, Mexico, pp. 127 & 128 ; *nitidus*, Thor., syn. *tenuis*, *republicanus*, W. Indies, Mexico, pp. 129 & 130 ; *testaceus* (de Geer), W. Indies, pp. 130 & 131 ; *gracilis* (Latr.), syn. *nigrifrons*, *heterurus*, Neotropical Region, pp. 131-133 ; *degeerii* (Gerv.), syn. *gambiensis*, Neotropical, pp. 133-135 ; *hemprichii* (Gerv.), Cuba, pp. 135-137 ; *laticauda* (Thor.), Brazil, pp. 137-139 ; *princeps*, Karsch, Hayti, p. 139.

✓ *Ananteris*, n. g. (*Buthidæ*), p. 65, *balzanii*, n. sp., Matto Grosso, pp. 66-70, pl. iv ; THORELL (3).

*Isometrus tricarinatus* (Sim.), Madras, pp. 433-435, pl. xi, fig. 1 ; *scutillus* (C. Koch), syn. *weberi*, *messor*, *phipsoni*, E. Indies, pp. 435 & 436 ; *hosei*, n. sp., Baram, pp. 436-438, pl. xi, fig. 2 ; *infuscatus*, n. sp., Philippine Is., pp. 438 & 439 ; *armatus*, n. sp., Port Essington, pp. 439-441, pl. xi, fig. 3 ; *serratus*, n. sp., Round I., pp. 441-443, pl. xi, fig. 4 ; *burdoi*, Sim., Lake Nyassa, Kilimanjaro, pp. 443-445, pl. xi, fig. 5 ; *asper*, n. sp., Angola, Congo, pp. 445-447 ; Pocock (1) : *bituberculatus*, n. sp., Baudin I., pp. 243 & 244 ; *id.* (2).

*Buthus martensii* (Karsch) is a synonym of *B. nigro-lineatus* (Dufour), pp. 672 & 673 (in note) ; THORELL (2) : *scaber* (Hempr. & Ehrb.), ? syn. *dimidiatus*, Simon, not syn. *gibbosus* (Brullé), Perim I. ; *confucius*, Sim., not syn. *gibbosus* (Brullé), pp. 241 & 242 ; Pocock (2).

*Urodacus novæ-hollandiæ*, Peters, Freemantle (Perth) ; *keyserlingii*, n. sp., syn. *novæ-hollandiæ*, Keys., not Peters, pp. 244 & 245 ; *id.* (2).

✓ *Iodacus*, n. g., p. 245, *darwinii*, n. sp., Port Darwin, pp. 245-247 ; *id.* (2).

## SOLIFUGÆ.

*Galeodes blanchardi*, n. sp., Kef el Dor (Sahara), pp. 198 & 199 ; SIMON (2).

## ARANEÆ.

### FAUNISTIC.

#### PALÆARCTIC REGION.

*Great Britain.* O. P. CAMBRIDGE (1), F. CAMBRIDGE (1, 2).

*Holland.* VAN HASSELT (1).

† *Madeira.* VAN HASSELT (2).

*Sahara.* SIMON (2).

*Western Siberia.* SIMON (5).

#### NEARCTIC REGION.

*United States.* BANKS, EMERTON, FOX, MARX, STONE.

## ETHIOPIAN REGION.

*Upper Congo.* SIMON (3).*Madagascar.* LENZ.

## ORIENTAL REGION.

*Nicobar Is., Singapore, &c.* THORELL (1).*Sumatra, Celebes, &c.* VAN HASSELT (3).

## AUSTRALIAN REGION.

*New Zealand.* GOYEN, LAING, URQUHART.

## NEOTROPICAL REGION.

*Central America.* O. P. CAMBRIDGE 2).*Costa Rica.* SIMON (6).*St. Vincent W. Indies.* SIMON (8).

## SYSTEMATIC.

## THERAPHOSIDÆ.

*Spharobothria hoffmanni*, Karsch, Costa Rica, pp. 89 & 90; O. P. CAMBRIDGE (2).*Eurypelma mesomelas*, n. sp., Costa Rica, pp. 90 & 91, pl. xi, fig. 8; *id. t. c.*↓ *Davus*, n. g., p. 91, *fasciatus*, n. sp., Costa Rica, pp. 91 & 92; *id. t. c.*↓ *Macrothele digitata*, n. sp., Guatemala, pp. 92 & 93; *id. t. c.*↓ *Anisaspis*, n. g., pp. 549 & 550, *tuberculata*, n. sp., St. Vincent, p. 550; SIMON (8).*Pachylomerus salebrosus*, n. sp., St. Vincent, pp. 550 & 551; *id. t. c.**Phænothele insularis*, n. sp., St. Vincent, p. 551; *id. t. c.**Pachyloscelis robustus*, n. sp., Veragua, pp. 93 & 94; O. P. CAMBRIDGE (2).*Calommata sundaica* (Dol.), Buitenzorg, pp. 200-202; HASSELT (3).↓ *Myrtale*, n. g., p. 300, *perroti*, n. sp., Tamatave, pp. 300 & 301; SIMON (4).*Migas sandageri*, n. sp., Mokohinou I. (New Zealand), pp. 123-126, pl. xxi; GOYEN.*Atrax robusta*, Cambr., Australia, pp. 301 & 302; *modesta*, n. sp., Melbourne, p. 302; SIMON (4).*Cyrtachenius talpa*, n. sp., California, pp. 302 & 303; *id. t. c.**Hermacha leporina*, n. sp., Theresopolis, p. 303; *dispar*, n. sp., Theresopolis, pp. 303 & 304; *id. t. c.*↓ *Damarchus*, n. g., pp. 14 & 15, *workmanni*, n. sp., Singapore, pp. 15-17; THORELL (1).*Brachythele virgata*, n. sp., Margelhan (Centr. Asia), p. 304; *longitarsis*, n. sp., California, p. 305; *thereneti*, n. sp., California, p. 305; SIMON (4).*Hapalothele auricornis*, n. sp., Para, pp. 305 & 306; *albovittata*, n. sp., Amazons, p. 306; *id. t. c.*



*Macrothele fuliginea*, n. sp., Java, pp. 306 & 307; *insignipes*, n. sp., New Zealand, p. 307; *id. t. c.*

*Trichopelma flavicomum*, n. sp., Brazil, p. 308; *id. t. c.*

*Ischnocolus linteatus*, n. sp.; Pondicherry, p. 308; *asper*, n. sp., Java, pp. 308 & 309; *id. t. c.*: *sub-armatus*, n. sp., Nanchovry, pp. 13 & 14; THORELL (1).

*Phlogius efferus*, n. sp., I. Halmahera, pp. 309 & 310; *imbellis*, n. sp. Borneo, p. 310; SIMON (4): *insignis*, n. sp., Sumatra, pp. 203 & 204; *id. (7).*

*Selenocosmia hasselti*, n. sp., Sumatra, p. 310; *id. (4)*: *javanensis* (Walck.), Nicobar I., p. 10; THORELL (1).

*Eurypelma pulchripes*, n. sp., Paraguay, p. 311; *campestratum*, n. sp., Paraguay, pp. 311 & 312; SIMON (4).

*Avicularia glauca*, n. sp., Panama, p. 312; *id. t. c.*

*Hapalopus ruficeps*, n. sp., Costa Rica, p. 109; *id. (6).*

*Omoothymus*, n. g., pp. 10 & 11; *schizædtei*, n. sp., Pinang, pp. 11 & 12; THORELL (1).

*Tapinauchenius sancti-vincentii* (Walck.), St. Vincent, p. 553; SIMON (8).

*Stothis affinis*, n. sp., St. Vincent, p. 552; *id. t. c.*

*Solenothele*, n. g. (near *Ischnocolus*), p. 297, *decemnotata*, n. sp., Congo, p. 298; *id. (3).*

*Phoneiusa greshoffi*, n. sp., Congo, p. 298; *id. t. c.*

*Thelecoris rutenbergi*, Karsch, syn. *Entomothele striatipes*, Sim., Nossi-Bé, p. 163; LENZ.

*Accola modesta*, n. sp., St. Vincent, p. 552; SIMON (8).

#### FILISTATIDÆ.

*Filistata insularis*, n. sp., Nicobar Is., pp. 17-19; THORELL (1).

#### DYSDERIDÆ.

*Usofila*, n. g., pp. 8 & 9, *gracilis*, n. sp., California, pp. 9 & 10, pl. i, fig. 6; MARX.

*Dysdera interrita*, Hentz, Massachusetts, pp. 200 & 201, pl. viii, fig. 2; EMERTON.

*Ariadne bicolor* (Hentz), Massachusetts, pp. 201 & 202, pl. viii, fig. 3; *id.*: *solitaria*, n. sp., St. Vincent, p. 556; SIMON (8).

#### OONOPIDÆ.

*Dysderina*, n. g., pp. 556 & 557, *principalis* (Keys.), St. Vincent, p. 557; *princeps*, n. sp., St. Vincent, pp. 557 & 558; *spinigera*, n. sp., St. Vincent, p. 559; SIMON (8).

*Cinetomorpha*, n. g., pp. 558 & 559, *simplex*, n. sp., St. Vincent, p. 559; *id. t. c.*

† *Pelcinus*, n. g., p. 559, *marmoratus*, n. sp., St. Vincent, pp. 559 & 560 ;  
*id. t. c.*

† *Opopæa*, n. g., p. 560, *deserticola*, n. sp., St. Vincent, p. 560 ; *id. t. c.*

† *Tricaris*, n. g., p. 561, *stenaspis*, n. sp., St. Vincent, p. 561 ; *id. t. c.*

*Scaphiella*, n. g., p. 561, *cymballaria*, n. sp., St. Vincent, pp. 561 & 562 ;  
*id. t. c.*

† *Ischnaspis*, n. g., p. 562, *peltifer*, n. sp., St. Vincent, pp. 562 & 563 ;  
*id. t. c.*

*Oonops spinimanus*, n. sp., St. Vincent, p. 563, pl. xlii, fig. 6 ; *globimanus*,  
 n. sp., St. Vincent, fig. 7 ; *pulicarius*, n. sp., St. Vincent, p. 564, fig. 8 ;  
*figuratus*, n. sp., St. Vincent, p. 564, fig. 9 ; *id. t. c.* : *septem-cincta*, n. sp.,  
 Wellington, pp. 128 & 129, pl. xxi, fig. 1 ; URQUIHART.

*Stenoonops*, n. g., p. 565, *scabriculus*, n. sp., St. Vincent, p. 565 ; SIMON  
 (8).

## CAPONIIDÆ.

*Nops*, MacLeay, p. 572, *coccineus*, n. sp., St. Vincent, pp. 572 & 573 ;  
 SIMON (8).

† *Caponina*, n. g., p. 573, *testacea*, n. sp., St. Vincent, p. 573 ; *id. t. c.*

## PALPIMANIDÆ.

*Otiothops oblongus*, n. sp., St. Vincent, pp. 574 & 575 ; SIMON (8).

## DRASSIDÆ.

† *Satricum*, n. g., p. 99, *gnaphosoides*, n. sp., Guatemala, p. 99 ; O. P. CAM-  
 BRIDGE (2).

*Pacilochroa behnii*, n. sp., Nanchovry, pp. 19 & 20 ; THORELL (1).

† *Pranopis*, n. g., pp. 20 & 21, *punctata*, n. sp., Nanchovry, pp. 21-23 ;  
*id.* (1).

*Corinnomma comatulatum*, n. sp., Sanbelong, pp. 23-25 ; *id.* (1).

† *Tolophus*, n. g., pp. 25 & 26 ; *submaculatus*, n. sp., Nicobar Is., pp. 26 &  
 27 ; *id.* (1).

*Eutitha conspersa*, n. sp., Pulo Milo, pp. 27-29 ; *incompta*, n. sp.,  
 Nicobar Is., pp. 29 & 30 ; *id.* (1).

*Micaria*, p. 167, *longipes*, n. sp., Massachusetts, pp. 167 & 168, pl. iii,  
 fig. 1 ; *montana*, n. sp., Mt. Washington, p. 168, pl. iii, fig. 2 ; EMERTON.

† *Geotrecha*, n. g., pp. 168 & 169, *bivittata*, n. sp., Massachusetts, pp. 169  
 & 170, pl. iii, fig. 3 ; *pinnata*, n. sp., Massachusetts, &c., pp. 170 & 171,  
 pl. iii, fig. 4 ; *crocata* (Hentz), Massachusetts, &c., p. 171 ; *id.*

*Prosthesima*, p. 172, *atra* (Hentz), Massachusetts, &c., p. 172, pl. iii,  
 fig. 6 ; *depressa*, n. sp., Massachusetts, p. 173, pl. iii, fig. 8 ; *ecclesiastica*  
 (Hentz), Massachusetts, pp. 173 & 174, pl. iii, fig. 7 ; *id.*

*Pacilochroa*, p. 174, *variegata* (Hentz), Massachusetts, pp. 174 & 175,  
 pl. iv, fig. 1 ; *montana*, n. sp., Mt. Washington, p. 175, pl. iv, fig. 2 ; *biline-*  
*ata* (Hentz), p. 175, pl. iv, fig. 3 ; *id.*

*Gnaphosa brumalis*, Thor., Mt. Washington, Anticosti, pp. 175 & 176, pl. iv, fig. 5; *conspersa*, Thor., New England, pp. 176 & 177, pl. iv, fig. 4; *id.*

*Pythonissa imbecilla*, n. sp., Massachusetts, &c., pp. 177 & 178, pl. iv, fig. 6; *id.*

*Drassus*, p. 178, *saccatus*, n. sp., New England, pp. 178 & 179, pl. iv, fig. 7; *robustus*, n. sp., Massachusetts, p. 179, pl. iv, fig. 8; *id.*

*Clubiona*, p. 179, *crassipalpis*, n. sp., New England, p. 180, pl. v, fig. 1; *mixta*, n. sp., Salem, &c., p. 180, pl. v, fig. 2; *tibialis*, n. sp., Massachusetts, pp. 180 & 181, pl. v, fig. 3; *canadensis*, n. sp., Mt. Washington, Montreal, p. 181, pl. v, fig. 4; *minuta*, n. sp., Massachusetts, p. 181, pl. v, fig. 11; *pusilla*, n. sp., Salem, pp. 181 & 182, pl. v, fig. 5; *rubra*, n. sp., New England, p. 182, pl. v, figs. 6 & 7; *ornata*, n. sp., Massachusetts, p. 183, pl. v, fig. 9; *excepta*, L. Koch, Massachusetts, p. 183, pl. v, fig. 10; *id.*

*Chiracanthium viride*, n. sp., Massachusetts, p. 184, pl. v, fig. 12; *id.*

*Trachelas ruber*, n. sp., Massachusetts, pp. 184 & 185, pl. v, fig. 13; *id.*

*Anypheua*, p. 185, *rubra*, n. sp., Massachusetts, p. 186, pl. vi, fig. 1; *incerta*, n. sp., Salem, p. 186, pl. vi, fig. 2; *calcarata*, n. sp., Massachusetts, p. 187, pl. vi, fig. 3; *saltabunda* (Hentz), Massachusetts, pp. 187 & 188, pl. vi, fig. 4; *id.*

*Phrurolithus*, p. 183, *pugnatus*, n. sp., Massachusetts, p. 188, pl. vi, fig. 6; *alaris* (Hentz), Massachusetts, p. 189, pl. vi, fig. 5; *id.*

*Agræca pratensis*, n. sp., Massachusetts, p. 190, pl. vi, fig. 7; *id.* : *oswaldi*, n. sp., Nossi-Bé, pp. 169 & 170; LENZ.

✓ *Sergiolus*, n. g., p. 573, *elegans*, n. sp., St. Vincent, p. 574; SIMON (8).

#### DICTYNIDÆ.

✓ *Neophanes*, n. g., pp. 6 & 7, *pallidus*, n. sp., N. America, p. 7, pl. i, fig. 4; MARX.

✓ *Prodalia*, n. g., pp. 7 & 8, *fozii*, n. sp., Tennessee, p. 8, pl. i, fig. 5; *id.*

*Fecenia protensa*, n. sp., Nanchovry, pp. 31-33; THORELL (1).

#### ZODARIIDÆ.

*Habronestes*, L. K., pp. 3 & 4, *americanus*, N. America, pp. 4 & 5, pl. i, fig. 2; MARX : *celeripes*, n. sp., Mt. Egmont, pp. 132-134, pl. xxi, fig. 2; *scitula*, n. sp., Stratford, pp. 135 & 136, pl. xxi, fig. 5; URQUHART.

#### AGALENIDÆ.

Family characterised, pp. 190 & 191; EMERTON.

*Celotes*, p. 191, *medicinalis* (Hentz), Massachusetts, pp. 191 & 192, pl. vii, fig. 1; *longitarsus*, n. sp., Mt. Carmel, Connecticut, p. 192, pl. vii, fig. 2; *montanus*, n. sp., Connecticut, pp. 192 & 193, pl. vii, fig. 3; *hybridus*, n. sp., New York, p. 193, pl. vii, fig. 4; *id.*

*Tegenaria*, p. 193, *derhamii*, Scop., pp. 193 & 194, pl. vii, fig. 6; *brevis*,

n. sp., New England, p. 194, pl. vii, fig. 5 ; *id.* : *arboricola*, n. sp., Mt. Egmont, pp. 129-132, pl. xxi, fig. 8 ; URQUHART : *hibernica*, n. sp., Ireland, pp. 86 & 87, fig. 4 ; O. P. CAMBRIDGE (1).

*Cicurina*, p. 194, *complicata*, n. sp., Massachusetts, p. 195, pl. vii, fig. 7 ; EMERTON.

*Hahnia*, p. 195, *bimaculata*, n. sp., New England, p. 196, pl. vii, fig. 8 ; *radula*, n. sp., Jaffres, p. 196 ; *cinerea*, n. sp., New England, p. 197, pl. vii, fig. 9 ; *id.*

*Agalena*, p. 197, *nævia*, Walck., United States, pp. 197-200, pl. viii, fig. 1 ; *id.*

↓ *Anomalomma*, n. g., p. 199, *lycosinum*, n. sp., Tjibodas, p. 200 ; SIMON (7).

#### LEPTONETIDÆ.

↓ *Ochyrocera*, n. g., p. 565, *arietina*, n. sp., St. Vincent, p. 566, pl. xlii, fig. 10 ; *quinquevittata*, n. sp., St. Vincent, p. 566, pl. xlii, fig. 11 ; SIMON (8).

↓ *Theoclia*, n. g., p. 567, *radiata*, n. sp., St. Vincent, p. 567, pl. xlii, fig. 12 ; *id. t. c.*

#### SCYTODIDÆ (SICARIIDÆ).

*Dictis fumida*, n. sp., Nicobar Is., Assam, pp. 33-35 ; THORELL (1).

*Scytodes oswaldi*, n. sp., Nossi-Bé, pp. 172 & 173, pl. i, fig. 10 ; LENZ : *longipes*, Luc., syn. *marmorata*, Tacz., *taczanowskii*, Thor., St. Vincent, pp. 567 & 568, pl. xlii, fig. 13 ; *hebraica*, n. sp., St. Vincent, pp. 568 & 569, fig. 14 ; *bajula*, n. sp., St. Vincent, pp. 569 & 570, fig. 15 ; *lineatipes*, Tacz., St. Vincent, pp. 570 & 571, figs. 16 & 17 ; *fusca*, Walck., syn. *guyanensis*, Tacz., St. Vincent, p. 571 ; SIMON (8).

*Drymusa*, n. g., p. 571, *nubila*, n. sp., St. Vincent, p. 572 ; *id. t. c.*

#### THERIDIIDÆ.

Synopsis of the subfamily *Linyphini*, pp. 7-73 ; F. CAMBRIDGE (1).

*Linyphia sennio*, n. sp., Mt. Egmont, pp. 137-140, pl. xxi, figs. 15 & 16 ; *multicolor*, n. sp., Stratford, pp. 140-142 ; *cruentum*, n. sp., Stratford, pp. 142 & 143 ; *albo-apiata*, n. sp., Stratford, pp. 143-146 ; *pellos*, n. sp., Mt. Egmont, pp. 146 & 147, pl. xxi, fig. 10 ; URQUHART.

*Leptyphantes*, pp. 73 & 74, *zebrinus*, Menge, England, pp. 74-76, pl. ii, fig. 1 ; *tenebricola*, Wider, England, pp. 76-78, pl. ii, fig. 2 ; *pinicola*, Sim., Helvellyn, pp. 78 & 79, pl. ii, fig. 3 ; F. CAMBRIDGE (1).

*Opisthoxys subacuta*, n. sp., England, pp. 92 & 93, fig. 3 ; O. P. CAMBRIDGE (1).

*Microneta*, pp. 82 & 83, *sublimis*, Camb., Cheviot Hills, Helvellyn, pp. 83-85, pl. ii, fig. 7 ; synopsis of British species of the genus, pp. 85 & 86 ; F. CAMBRIDGE (1).

*Tmeticus bicolor* (Bl.), pl. ii, fig. 5, and *concinus* (Thor.), pl. ii, fig. 6, described and compared, p. 87; *id. t. c.*

*Ariamnes flavo-notatus*, n. sp., Stratford, pp. 136 & 137; URQUHART.

*Theridium punica-punctata*, n. sp., Stratford, pp. 147 & 148; *apiatum*, n. sp., Stratford, pp. 148-150; *litteratum*, n. sp., Stratford, pp. 150 & 151; *id.*: *aureo-signatum*, n. sp., Tamatave, pp. 173 & 174, pl. ii, fig. 12; *argenteo-squamatum*, n. sp., Tamatave, p. 174; LENZ.

*Erigone zonata* (Walck.), Tamatave, pp. 174 & 175, pl. ii, figs. 13 & 14; *id.*

*Erigone* (*Ceratinella*) *alba*, n. sp., p. 44; *alticeps*, n. sp., *melanocnemis*, n. sp., *tibialis*, n. sp., Columbia, p. 45; *parvula*, n. sp., Hollis, N. H., p. 45; Fox.

✓*Erycina*, n. g., p. 151, *violacea*, n. sp., Stratford, pp. 152 & 153, pl. xxi, figs. 4, 14, & 17; URQUHART.

*Cornicularia crinifrons*, n. sp., Stratford, pp. 155 & 156, pl. xxi, fig. 11; *id.*

*Argyrodes fissifrons*, Cambr., n. var. *terressæ*, Terressa (Nicobar Is.), pp. 35 & 36; THORELL (1).

✓*Anelosimus*, n. g., p. 11, *socialis*, n. sp., Venezuela, pp. 11 & 12, pl. 2; SIMON (1).

#### ULOBORIDÆ.

*Uloborus modestus*, n. sp., Nanchovry, pp. 36 & 37; THORELL (1): *penicillatus*, n. sp., St. Vincent, pp. 554 & 555; SIMON (8): *republicanus*, n. sp., San Esteban, pp. 12 & 13; *raffrayi*, n. sp., Singapore, pp. 13 & 14; *id.* (1).

#### MIAGRAMMOPIDÆ.

*Miagrammopes albo-maculatus*, n. sp., Nicobar Is., pp. 38 & 39; THORELL (1): *scoparius*, n. sp., St. Vincent, p. 555; SIMON (8).

#### CRYPTOTHELIDÆ.

✓*Lutica*, n. g., p. 5, *maculata*, n. sp., p. 6, Oregon, pl. i, fig. 3; MARX.

#### TETRAGNATHIDÆ.

*Tetragnatha delumbis*, n. sp., Nicobar Is., pp. 39-41; *parvula*, n. sp., Kamorta, pp. 41-44; THORELL (1): *arborea*, n. sp., Stratford, Taranaki, pp. 172-175, pl. xxi, fig. 9; *multi-punctata*, n. sp., Taranaki, p. 176; *flavida*, n. sp., Belmont, Mt. Egmont, &c., pp. 177-179; URQUHART.

#### EPEIRIDÆ.

✓*Kaira gibberosa*, n. sp., Veragua, p. 57; O. P. CAMBRIDGE (2).

✓*Edricus*, n. g., p. 57, *spinigerus*, n. sp., Bugaba, p. 58; *id. t. c.*

✓*Keyserlingia*, n. g., p. 58, *cornigera*, n. sp., Bugaba, pp. 58 & 59; *id. t. c.*

*Callinethis nicobarica*, n. sp., Nicobar Is., pp. 44-46; *tristicta*, n. sp., Nanchovry, pp. 46 & 47; THORELL (1).

*Larinia melanosticta*, n. sp., Nanchovry, pp. 47-49; *id.* (1).

*Cercidia decora*, n. sp., Biskra, p. 198; SIMON (2).

*Epeira galathea*, n. sp., Bolivia, pp. 53 & 54 (in note); THORELL (1) : *atri-apiata*, n. sp., Hastwell, pp. 156-158; *acineta*, n. sp., Mt. Egmont, pp. 158 & 159; *nigro-hastula*, n. sp., Stratford, pp. 159-162, pl. xxi, fig. 13; *atri-hastula*, n. sp., Stratford, pp. 162 & 163, pl. xxi, fig. 7; *galbana*, n. sp., Stratford, pp. 163-165; *venustula*, n. sp., Stratford, pp. 165 & 166, pl. xxi, fig. 12; *melania*, n. sp., Stratford, pp. 166 & 167; *similaris*, n. sp., Stratford, pp. 168-171; *laevigata*, n. sp., Stratford, pp. 171 & 172, pl. xxi, fig. 6; URQUHART : *kraepelini*, n. sp., Tamatave, pp. 176 & 177, pl. ii, fig. 16; *annulata*, n. sp., Nossi-Bé, pp. 177 & 178, pl. ii, fig. 18; *pallescens*, n. sp., Nossi-Bé, pp. 178 & 179, pl. ii, fig. 15; *cinerea*, Lenz, pp. 179 & 180, Tamatave; LENZ : *socialis*, Holmb., Brazil, &c., p. 10; *bandelieri*, n. sp., Venezuela, pp. 10 & 11; SIMON (1).

*Argiope macrochara*, n. sp., Nicobar Is., pp. 50-52; THORELL (1).

*Nephilengys cruentata* (Fabr.), Madagascar, pp. 180 & 181, pl. ii, fig. 19; LENZ.

*Cyrturachne decem-tuberculata*, n. sp., Bugaba; O. P. CAMBRIDGE (2) : *invenusta*, n. sp., Nicobar Is., pp. 55-57; THORELL (1).

*Poltys pogonias*, n. sp., Nicobar Is., pp. 54 & 55; *id.* (1).

*Acrosoma furcula*, n. sp., Guatemala, p. 60, pl. viii, fig. 11; *parallellum*, n. sp., Bugaba, pp. 60 & 61, pl. viii, fig. 15; *longicauda*, n. sp., Bugaba, p. 61, pl. viii, fig. 9; *culcaratum*, n. sp., Bugaba, p. 62, pl. viii, fig. 8; *brevipes*, n. sp., Bugaba, pp. 62 & 63, pl. viii, fig. 10; *vitiosum*, n. sp., Bugaba, p. 63, pl. viii, fig. 14; *12-spinosum*, n. sp., Bugaba, pp. 63 & 64, pl. viii, fig. 12; *fericulum*, n. sp., Guatemala, p. 64, pl. viii, fig. 13; O. P. CAMBRIDGE (2).

*Gastracantha brevispina* (Dol.), Nicobar Is., pp. 58-60; THORELL (1).

*Arachosia puta*, n. sp., Panama, p. 100; O. P. CAMBRIDGE (2).

#### THOMISIDÆ.

*Xysticus adustus*, n. sp., Guatemala, pp. 70 & 71, pl. ix, fig. 11; *advectus*, n. sp., Guatemala, p. 71, pl. ix, fig. 12; O. P. CAMBRIDGE (2).

*Thomisus rosenbergi*, n. sp., Tamatave, pp. 165 & 166, pl. i, fig. 2; LENZ.

*Cyriogonus simonis*, n. sp., Tamatave, pp. 166 & 167, pl. i, fig. 3; *id.*

*Runcinia vigilans*, n. sp., Guatemala, pp. 72 & 73, pl. ix, figs. 4 & 5; *tibialis*, n. sp., Bugaba, p. 73, pl. x, fig. 3; *blanda*, n. sp., Panama, pp. 74 & 75, pl. x, figs. 1 & 2; *rugosa*, n. sp., Panama, p. 75; *depressu*, n. sp., Guatemala, pp. 75 & 76, pl. x, figs. 4 & 5; *signata*, n. sp., Guatemala, pp. 76 & 77, pl. ix, fig. 6; *propinqua*, n. sp., Bugaba, pp. 77 & 78, pl. x, fig. 6; *lutea*, n. sp., Guatemala, p. 78, pl. ix, fig. 13; *annulipes*, n. sp., Guatemala, pp. 78 & 79, pl. ix, fig. 14; O. P. CAMBRIDGE (2) : *distincta*, Thor., Nicobar Is., p. 93; *kinbergii*, Thor., Java, p. 94; THORELL (1).

*Synema bimaculata*, n. sp., Guatemala, pp. 71 & 72, pl. ix, figs. 7 & 8;

*cirripes*, n. sp., Guatemala, pp. 79 & 80, pl. x, fig. 11; *puta*, n. sp., Guatemala, p. 80, pl. x, fig. 9; *palliat*a, n. sp., Bugaba, p. 81, pl. x, fig. 8; *maculosa*, n. sp., Guatemala, pp. 81 & 82, pl. x, fig. 10; *affinitata*, n. sp., Guatemala, pp. 82 & 83, pl. x, figs. 12 & 13; *socia*, n. sp., Bugaba, pp. 83 & 84, pl. xi, fig. 4; *profuga*, n. sp., Bugaba, p. 84, pl. xi, fig. 3; *adjuncta*, n. sp., Panama, pp. 84 & 85, pl. xi, fig. 1; O. P. CAMBRIDGE (2).

*Tibellus punctipes*, n. sp., Guatemala, p. 79, pl. ix, fig. 15; *id. t. c.*

*Strophius hirsutus*, n. sp., Bugaba, p. 87, pl. xi, fig. 9; *signatus*, n. sp., Guatemala, pp. 103 & 104; *id. t. c.*

*Bucranium spinigerum*, n. sp., Bugaba, pp. 87 & 88, pl. xi, fig. 11; *id. t. c.*

*Thanatus punctiger*, n. sp., Guatemala, pp. 88 & 89, pl. xi, fig. 12; *id. t. c.*

*Philodromus rubro-frontus*, n. sp., Mt. Cook, pp. 179-181; URQUHART.

*Dicaea puta*, n. sp., Bugaba, p. 85, pl. xv, fig. 5; O. P. CAMBRIDGE (2).

*Misumena pascalis*, n. sp., Panama, pp. 81-86, pl. xi, fig. 6; *pallida*, n. sp., Veragua, pp. 86 & 87, pl. xi, fig. 10; *conjuncta*, n. sp., Veragua, p. 86, pl. xi, fig. 7; *particeps*, n. sp., Guatemala, p. 103; O. P. CAMBRIDGE (2).

*Tmarus ineptus*, n. sp., Panama, p. 94; *mundulus*, n. sp., Bugaba, p. 95; *corruptus*, n. sp., Bugaba, pp. 95 & 96; *intentus*, n. sp., Guatemala, p. 96; *pauper*, n. sp., Bugaba, pp. 96 & 97; *studiosus*, n. sp., Bugaba, pp. 97 & 98; *decens*, n. sp., Bugaba, p. 98; *id. t. c.*

*Peltorhynchus rostratus*, Thor., Pinang, pp. 88 & 89; THORELL (1).

*Loxobates ornatus*, n. sp., Pinang, pp. 89-91; *id. (1).*

*Orus*, n. g., p. 91, *virens*, n. sp., Singapore, pp. 91-93; *id. (1).*

*Daradius armillatus*, n. sp., Nicobar Is., pp. 94 & 95; *id. (1).*

*Phrynarachne papulata*, n. sp., Sumatra, pp. 95-97; *ceylonica* (Cambr.), Sumatra, pp. 97 & 98; *id. (1).*

*Boliscus*, n. g., p. 98, *segnis*, n. sp., Singapore, pp. 98-100; *id. (1).*

## SPARASSIDÆ.

*Olios erroneus*, n. sp., Guatemala, pp. 67 & 68, pl. ix, fig. 1; *manifestus*, n. sp., Guatemala, p. 68 & 69, pl. viii, figs. 16 & 18; *sagus*, n. sp., Guatemala, p. 69, pl. ix, fig. 3; *exasperans*, n. sp., Guatemala, pp. 69 & 70, pl. ix, fig. 2; O. P. CAMBRIDGE (2).

*Spariolenus megaloptes*, n. sp., Nicobar Is., pp. 77 & 78; THORELL (1).

*Sarotes pinangensis*, n. sp., Pinang, pp. 78-80; *tener*, n. sp., Assam, pp. 80-82; *id. (1)*; *inequipes*, n. sp., Maumeri (Flores), pp. 206 & 207; SIMON (7).

*Sadala simonii*, n. sp., Guatemala, p. 65, pl. viii, fig. 17; *fugiens*, n. sp., Guatemala, p. 66, pl. ix, fig. 10; O. P. CAMBRIDGE (2).

*Vindullus similis*, n. sp., Guatemala, p. 67, pl. ix, fig. 9; *id. t. c.*

✓ *Prusias*, n. g., p. 101, *nugalis*, n. sp., Bugaba, pp. 102; *id. t. c.*

✓ *Ramnes*, n. g., p. 102, *semotus*, n. sp., Bugaba, pp. 102 & 103; *id. t. c.*

✓ *Homolonychus*, n. g., p. 2, *selenopoides*, n. sp., N. America, p. 3, pl. i, fig. 1; MARX.

*Tortula gloriosa*, Sim., Buitenzorg, pp. 204 & 205 ; SIMON (7).

*Seramba bifasciata*, n. sp., Nicobar Is., pp. 82-84 ; THORELL (1).

<sup>1</sup>*Pharta*, n. g., pp. 84 & 85, *bimaculata*, n. sp., Singapore, pp. 85 & 86 ;  
*id.* (1).

<sup>1</sup>*Mastira*, n. g., pp. 86 & 87, *bipunctata*, n. sp., Singapore, pp. 87 & 88 ;  
*id.* (1).

*Damastes oswaldi*, n. sp., Tamatave, pp. 167 & 168, pl. i, fig. 4 ; LENZ.

*Isopeda imerinensis* (Vins.), syn. *Holconia malagasii*, Karsch, Tamatave, &c., pp. 168 & 169 ; *id.*

#### OXYOPIDÆ.

*Peucetia quadrilineata*, n. sp., Costa Rica, pp. 111 & 112 ; SIMON (6).

*Oxyopes lineatipes* (C. K.), Indo-Malaysia, p. 71 ; *javanus*, Thor., syn. *lineatipes*, Sim., Burma, Indo-Malaysia, p. 71 ; *gemellus*, n. sp., Pinang, pp. 71-73 ; *longinquus*, Thor., Nicobar Is., pp. 73-75 ; THORELL (1).

*Tapponia insulana*, n. sp., Kamorta, pp. 75 & 76 ; *id.* (1).

#### CTENIDÆ.

*Ctenus mordax*, n. sp., Guatemala, pp. 100 & 101 ; O. P. CAMBRIDGE (2).

<sup>1</sup>*Cycloctenus pulcher*, n. sp., Wellington, pp. 183 & 184 ; URQUHART.

*Cupiemiis*, n. g., pp. 109 & 110, *getazi*, n. sp., Costa Rica, p. 110 ;  
*oculatus*, n. sp., Guatemala, pp. 110 & 111 ; *celerrimus*, n. sp., Brazil, p. 111 ; SIMON (6).

<sup>1</sup>*Acantheis*, n. g., near *Acanthoctenus*, for *variatus*, *dimidiatus*, *latus*, Thor., sub *Acanthoctenus*, p. 61 (in note) ; THORELL (1).

*Viridasius fasciatus* (Lenz), Nossi-Bé, p. 170 ; LENZ.

#### LYCOSIDÆ.

<sup>1</sup>*Dolopæus*, n. g., pp. 60 & 61, *cinctus*, n. sp., Kamorta, pp. 61-63 ;  
THORELL (1).

*Dendrolycosa gracilis*, n. sp., Kamorta, pp. 63-65 ; *id.* (1).

*Tarantula opifex* (Wagner), figured and described ; WAGNER (1).

*Lycosa pusiola*, Thor., Sumatra, p. 65 ; *thalassia*, n. sp., Nanchovry, pp. 65-68 ; *nicobarica*, n. sp., Nicobar Is., pp. 68-71 ; THORELL (1) : *arenaria*, n. sp., New Zealand, pp. 182 & 183 ; URQUHART : *robusta*, n. sp., Nossi-Bé, p. 171, pl. i, fig. 7 ; LENZ : *carolinensis*, W., p. 423, pl. xv, fig. 1 ; *tigrina*, McCook, syn. *vulpina*, Em., pp. 423 & 424, pl. xv, fig. 7 ; *nidicola*, Em., p. 424 ; *arenicola*, Scud., p. 425 ; *polita*, Em., pp. 425 & 426 ; *frondicola*, Em., p. 426, pl. xv, fig. 2 ; *kochii*, Keys., p. 426, pl. xv, fig. 3 ; *communis*, Em., pp. 426 & 427 ; *ochreatea*, Hentz, *punctulata*, Hentz, and *scutulata*, Hentz, p. 427 ; synopsis of the preceding species, all from Pennsylvania and New Jersey, pp. 422 & 423 ; STONE.



- Trochosa cinerea*, Fabr., p. 428, Pennsylvania ; *id.*  
*Pirata piratica*, Clerck, p. 429 ; *elegans*, n. sp., p. 429, pl. xv, fig. 25 ;  
*marci*, n. sp., pp. 429 & 430, pl. xv, fig. 1, Pennsylvania, New Jersey ; *id.*  
*Pardosa nigripalpis*, Em., pp. 430 & 431 ; *albopatella*, *bilineata*, and  
*lapidicina*, Em., p. 431 ; *nigra*, n. sp., p. 432, pl. xv, fig. 4, Pennsylvania  
and New Jersey ; *id.*  
*Ocyale undata* (Hentz), p. 432, Pennsylvania ; *id.*  
*Dolomedes tenebrosus*, Hentz, p. 433, pl. xv, fig. 8 ; *sexpunctatus*, Hentz,  
p. 433, Pennsylvania ; *id.*

## ATTIDÆ.

- Harmochirus malaccensis*, Sim., Sumatra, pp. 100-102 ; THORELL (1).  
*Homalattus latidens* (Dol.), Singapore, Pinang, p. 102 ; *leucomelas*, n. sp.,  
Manilla, pp. 102-104 ; *albostrigatus*, n. sp., Nicobar Is., pp. 104-106 ; *analis*,  
Thor., Sumatra, p. 107 ; *brevipes*, n. sp., Sumatra, pp. 107-109 ; *id.* (1).  
*Attus montinus*, n. sp., Mt. Cook, pp. 184-186 ; *monticolus*, n. sp., Mt.  
Cook, pp. 186 & 187 ; *valentulus*, n. sp., Auckland, pp. 187 & 188 ; URQU-  
HART.  
*Marpessa cineracea*, n. sp., Stratford, pp. 188 & 189 ; *id.*  
<sup>1</sup>*Zeuxippus*, n. g., pp. 109 & 110, *histrion*, n. sp., Vellore, pp. 110 & 111 ;  
THORELL (1).  
<sup>1</sup>*Dexippus*, n. g., p. 112, *kleinii*, n. sp., Sumatra, pp. 112-114 ; *id.* (1).  
*Thiania oppressa*, n. sp., Nicobar Is., Sumatra, pp. 114 & 115 ; *id.* (1).  
*Tapinattus melanognathus* (Luc.), Padang ; *brachygnathus*, Thor.,  
Sumatra, p. 115 ; *id.* (1).  
*Chrysilla debilis*, Thor., Pinang, p. 115 ; *reinhardtii*, n. sp., Nicobar Is.,  
pp. 116 & 117 ; *versicolor* (C. Koch), Pinang, pp. 117-120 ; *id.* (1).  
*Epocilla prætexta*, Thor., Pinang, pp. 120-122 ; *id.* (1).  
*Mævia alternans* (C. Koch), Pinang, pp. 122-124 ; *luteocincta*, n. sp.,  
Pinang, pp. 124 & 125 ; *id.* (1).  
*Telamonia peckhamii*, n. sp., Nicobar Is., pp. 125-129 ; *id.* (1).  
*Asamonea bella*, n. sp., Tamatave, pp. 164 & 165, pl. i, fig. 1 ; LENZ.  
<sup>1</sup>*Megatimus*, n. g., pp. 129 & 130, *severus*, n. sp., Pinang, pp. 130-132 ;  
THORELL (1).  
<sup>1</sup>*Colyttus*, n. g., p. 132, *bilineatus*, n. sp., Pinang, pp. 132-134 ; *id.* (1).  
*Euophrys pygæa*, n. sp., Pinang, pp. 135-137 ; *id.* (1).  
<sup>1</sup>*Spartæus*, n. g., p. 137, *gracilis*, n. sp., Padang, pp. 137-139 ; *id.* (1).  
<sup>1</sup>*Mantius*, n. g., pp. 139 & 140, *russatus*, n. sp., Pinang, pp. 140-142 ;  
*id.* (1).  
*Hasarius kjellerupii*, n. sp., Nicobar Is., pp. 142-145 ; *sulfuratus*, n. sp.,  
Sumatra, pp. 145-147 ; *virens*, n. sp., Pinang, pp. 147-149 ; *simonis*, Thor.,  
Nicobar Is., Singapore, p. 149 ; *id.* (1).

## OPILIONES.

## PALPATORES.

## PHALANGIIDÆ.

Synopsis of the Austro-Malayan species of the sub-family *Gagrellini*, pp. 678-679; THORELL (2).

† *Hypsibunus*, n. g., p. 679, *diadematus*, n. sp., Austro-Malaya, pp. 679-682; *id. t. c.*

*Zaleptus trichopus*, Thor., Sarawak, pp. 682-684; *ramosus*, n. sp., Singalang, pp. 684-686; *simplex*, n. sp., Singalang, pp. 686-688; *id. t. c.*

*Ceratobunus quadricornis*, n. sp., Lubu Selassi (Sumatra), pp. 689-691; *id. t. c.*

*Gagrella*, synopsis of Austro-Malayan and Papuan species, pp. 692 & 693; *longipalpis*, n. sp., Borneo, pp. 693-695; *arcuaria*, n. sp., Singalang, pp. 695-697; *bidentata*, n. sp., Further India, pp. 697-699; *ephippiata*, n. sp., Sumatra, pp. 699-702; *amboinensis* (Dol.), Amboina, pp. 701 & 702 (in note); *concinna*, n. sp., Singalang, pp. 702-704; *hasseltii*, n. sp., Austro-Malaya, pp. 704-706; *bipeltata*, n. sp., Arou I., pp. 707 & 708; *xanthostoma*, n. sp., Ramoi, pp. 708-710; *pullata*, n. sp., Singalang, pp. 710-712; *monticola*, n. sp., Singalang, pp. 712-715; *vestita*, n. sp., Tjibodas, pp. 715-717; *scrobiculata*, n. sp., Borneo, pp. 717-719; *id. t. c.*

√ *Marthana*, n. g., p. 719, *turrita*, n. sp., Further India, pp. 720-722; *columnaris*, n. sp., Borneo, pp. 722-724; *id. t. c.*

*Oncopus*, pp. 763 & 764, *truncatus*, n. sp., Singapore, pp. 764 & 765; *id. t. c.*

## LANIATORES.

Synopsis of the Indo- and Austro-Malayan families and genera of the *Laniatores*, pp. 724-727; THORELL (2).

## BIANTIDÆ.

*Biantes vitellinus*, n. sp., Ajur Mantjur, pp. 727 & 728; *id. t. c.*

*Beloniscus*, n. sp., p. 729; *quinque-spinosus*, n. sp., Ajur Mantjur, pp. 729-733; *morosus*, n. sp., Singalang, pp. 733-736; *id. t. c.*

√ *Acrobunus*, n. g., pp. 736 & 737, *nigro-punctatus*, n. sp., Singalang, pp. 737-740; *bifasciatus*, n. sp., Singalang, pp. 740-742; *id. t. c.*

*Epedanus javanus*, Thor., Tjibodas, pp. 742 & 743; *id. t. c.*

† *Sterrhosoma*, n. g., p. 743, *brevipulpe*, n. sp., Ajur Mantjur, pp. 743-746; *id. t. c.*

*Zalmoxis*, pp. 746 & 747, *dentata*, n. sp., Papua, pp. 747-750; *tristis*, n. sp., Papua, pp. 750-752; *id. t. c.*

## ASSAMIDÆ.

√ *Hyamus*, n. g., pp. 752 & 753, *formosus*, n. sp., Sumatra, pp. 753-757.

## ONCOPODIDÆ, p. 757.

- ✓ *Pelitus*, n. g., p. 757, *armillatus*, n. sp., Ajur Mantjur, pp. 758 & 759.  
*Gnomulus sumatranus*, n. sp., Singalang, pp. 759-763.

## ANEPIGNATHI.

## STYLOCELLIDÆ.

- Stylocellus*, and *Siro* compared, pp. 765 & 766 ;  
*Stylocellus sumatranus*, Westw., syn. *beccarii*, Thor., Sumatra, pp. 766 & 767 ; THORELL (2).

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- . (2) Nomenclatorische correctur innerhalb der Hydrachniden-Familie. *T. c.* pp. 19 & 20.
- . (3) Seltsame Begattung unter den Hydrachniden. *T. c.* pp. 253-256.
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— (3) Neue Gallmilben. Anz. Ak. Wien, xix, pp. 198 & 199.

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#### TROMBIDIIDÆ.

*Trombidium*, pt. 58, No. 8; BERLESE.

*Rhyncholophus*, pt. 59, No. 1, n. subg. *Apectolophus*, type *R. phalangoides*; *Achorolophus*, n. subg., types *R. nemorum* and *R. trimaculatus*;

*Abrolophus*, n. subg., type *R. quisquiliarum*, pt. 59, No. 1; *id.*

#### BDELLIDÆ.

*Ammonia*, pt. 59, No. 3, *latirostris* (Herm.), Italy, No. 4; *cæruleipes*, Duj., Sicily, No. 5; *id.*

*Bdella capillata*, Kram., Italy, Sicily, pt. 59, No. 6; *virgulata*, Can. & Fan., Italy, No. 7; *id.*

*Penthaleus*, pt. 50, No. 1, *ovatus*, Koch, Italy, No. 2; *egregius*, n. sp., Italy, No. 3; *id.*

*Notophallus*, pt. 50, No. 4, *hæmatopus*, Koch, Italy, No. 5; *id.*

*Eupodes*, pt. 50, No. 6, *variegatus*, Koch, Italy, No. 7; *fusifer*, Can., Italy, No. 8; *id.*

*Holotydeus*, n. g., pt. 50, No. 9; *hydromomus*, Berl. & Trouess., Venice, pt. 50, No. 10; *id.*

## HYDRACHNIDÆ.

*Hydrodroma rubra* (de Geer), Italy, pt. 58, No. 5; BERLESE.

*Atax fissipes*, n. sp., S. America, p. 15; KOENIKE (1).

*Mideopsis depressa*, Neum., is a synonym of *M. orbicularis*, O. F. Müller, p. 20; *id.* (2).

*Curvipes*, n. n. for *Nesæa*, preocc., p. 20; *id.* (2).

*Frontipoda*, n. n. for *Marica*, preocc., p. 19; *id.* (2).

*Axona*, syn. *Brachypoda*, p. 19; *id.* (2).

*Teutonia*, n. g., p. 75, *proxima*, n. sp., Germany, pp. 76-80; *id.* (5).

## GAMASIDÆ.

*Laelaps cuneifer*, n. sp., Tyrol, pp. 647 & 648, pl. xlix, fig. 2; *lævis*, n. sp., Tyrol, p. 648, pl. xlix, fig. 3; *myrmophila*, n. sp., Ajaccio, p. 649, pl. xlix, fig. 4; *equitans*, n. sp., Ajaccio, pp. 649 & 650, pl. l, fig. 5; *flexuosa*, n. sp., Tyrol, pp. 650 & 651, pl. l, fig. 6; *vacua*, n. sp., Tyrol, pp. 651 & 652, pl. l, fig. 7; *acuta*, n. sp., Tyrol, pp. 652 & 653, pl. l, fig. 8, all from ants' nests; MICHAEL (1).

*Uropoda canestriniana*, n. sp., in ants' nests, Italy, pt. 58, No. 4; BERLESE: *coccinea*, n. sp., Tyrol and Buxton, in ants' nest, pp. 646 & 647, pl. xlix, fig. 1; MICHAEL (1).

*Epicrius corniger*, n. sp., Venice, pt. 59, No. 2; BERLESE.

## ORIBATIDÆ.

*Eremæas minimus*, n. sp., Florence, pt. 58, No. 9; BERLESE: *fockeui*, n. sp., pp. 235 & 236; MONIEZ (1): on the synonymy of these species see MONIEZ (2).

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*Hæmaphysalis punctata*, Can. & Fan., Italy, pt. 58, No. 8; BERLESE.

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*Tyroglyphus* characterised, pt. 58, No. 2, *mycophagus*, Mégn., Italy, pt. 58, No. 1; BERLESE.

*Glyciphagus canestrinii*, Arm., Padova, pt. 58, No. 3; *pterophorus*, n. sp., Padova, pt. 58, No. 6; *id.*

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*Oecidophyes gracilis*, n. sp., pp. 385-387, pl. i, figs. 9 & 10; *longisetus*, n. sp., pp. 387 & 388, pl. ii, figs. 3 & 4, pl. iii, fig. 10; *trilobus*, n. sp., pp. 388-390, pl. iv, figs. 3, 4, & 7; NALEPA (1): *nudus*, Nal., p. 387, pl. iv, figs. 5 & 6; *euphorbiæ*, Nal., pp. 879-886, pl. iv, figs. 7 & 8; *id.* (2): *rubicolens*, n. sp., pp. 140 & 141; CANESTRINI (2).

*Phytocoptes*, n. g., p. 868, *dubius*, n. sp., p. 880, pl. ii, figs. 10-12; NALEPA (2).

*Phyllocoptes heterogaster*, n. sp., pp. 390-392, pl. iv, figs. 5 & 6; *id.* (1): *convolvuli*, Nal., p. 881, pl. ii, figs. 13 & 14; *obtusum*, Nal., pp. 881 & 882, pl. iv, figs. 1 & 2; *id.* (2).

*Tegonotus*, n. g., syn. *Acanthonotus*, Nal., pp. 392 & 393; *id.* (1): *acromius*, n. sp., pp. 882 & 883, pl. iii, figs. 9 & 10; *id.* (2).

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*Paradoxides lamellatus*, Har., p. 135, pl. xi, fig. 9 ; *mic-mac*, n. var. *pontificalis*, pp. 136-138, pl. xi, fig. 8.

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*Microdiscus bellimarginatus*, p. 630, pl. lxxxi, fig. 2 ; *convexus*, p. 631, pl. lxxx, fig. 9 ; *meeki*, pl. lxxxi, fig. 3 ; *parkeri*, pl. lxxx, fig. 7 ; *lobatus*, pl. lxxxi, fig. 4 ; *speciosus*, pl. lxxxi, fig. 5 ; *helena*, pl. lxxxi, fig. 1, p. 632.

*Olenellus thomsoni*, p. 635, pl. lxxxii, fig. 1, pl. lxxxiii, fig. 1 ; *gilberti*, p. 636, pl. lxxxiv, fig. 1, pl. lxxxv, fig. 1, pl. lxxxvi, fig. 1 ; *iddingsi*, p. 636, pl. lxxxiv, fig. 2 ; *walcotti*, p. 636, pl. lxxxviii, fig. 2.

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*Pycnogonum*, pp. 6 & 7, *littorale* (Ström.), pp. 7–12, pl. i, fig. 1 ; *crassirostris*, G. O. Sars, pp. 12–14, pl. i, fig. 2.

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*Chatonymphon*, pp. 100 & 101, *hirtum* (Kroy.), pp. 101–103, pl. xi, fig. 1 ; *hirtipes* (Bell), pp. 103–107, pl. xi, fig. 2 ; *spinosum* (Goodsir), pp. 107–109,

pl. xi, fig. 3; *tenellum*, G. O. Sars, pp. 109-111, pl. xii, fig. 1; *macronyx*, G. O. Sars, pp. 111-114, pl. xii, fig. 2.

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# MYRIOPODA AND PROTRACHEATA.

BY

R. INNES POCKOCK.

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*Henicops insignis*, n. sp., Juan Fernandez, pp. 154 & 155; *id.* (3).

*Eurylithobius*, Butl., was based upon the exuviated cuticle of *Scolopendra*, p. 53; *id.* (2).

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*Rhysida longicornis*, n. sp., Socotra, pp. 60 & 61, pl. iv, fig. 5; *calcarata*, n. sp., Cambodia, pp. 61 & 62, pl. iv, fig. 6; *id.* (2): *immarginata* (Porath), syn. *gynnopus* (Kohl.), *ceylonicum*, Haase, Burma, pp. 417 & 418; *id.* (1).

*Otostigma spinicauda* (Newport), described as *Branchiostoma*, syn. *deserti*, Meinert, p. 54; *id.* (2): *carinatum*, Porath, Burma, pp. 412 & 413; *rugulosum*, Burma, pp. 413 & 414; *spinosum*, Porath, S. Tenasserim, p. 414; *geophilinum*, Haase, Burma, pp. 414 & 415; *ceylonicum*, Haase, Burma, pp. 415 & 416; *fecæ*, n. sp., Burma, pp. 416 & 417; *id.* (1).

*Monops*, Gervais, is untenable, being established for Newport's species *Cryptops nigra*, which was based upon a figure representing in reality an *Otostigma* or *Rhysida*; *id.* (2).

*Rhombocephalus*, Newp., based upon young examples of *Scolopendra*, is a synonym of this genus; the species named *viridifrons* and *parva* by Newport being the young of *Sc. cingulata*, and *smaragdinus* of Butler being the young of *Sc. spinipes*, Leach; *id.* (2).

*Scolopendra fecæ*, n. sp., Burma, pp. 410 & 411; *pinguis*, n. sp., Burma, pp. 411 & 412; *id.* (1): *cuivis*, n. sp., loc.?, pp. 62 & 63, pl. iv, fig. 7; *id.* (2): *scopoliana*, Koch (1841), syn. *gervaisiana*, Koch (1863), p. 52; *id.* (2): *prasina*, C. K., Caraccas, p. 146; *complanata*, Newp., Caraccas, p. 147; *viridicornis*, Newp., Caraccas, p. 147; *viridilimbata*, n. sp., N. America, p. 148; *subspinipes*, var. *sexspinosa*, Newp., Trinidad, p. 148, n. var. *gracilipes*, Trinidad, p. 149, var. *concolor*, Newp., Java, p. 150; *morsitans*, n. var. *calcarata*, p. 150; var. *tigrina*, Linn., India, p. 152; *gigantea*, Linn., S. America, pp. 151 & 152; *dalmatica*, C. Koch, Balearic I., p. 152; *appendiculata*, n. sp., Argentine Republic, pp. 152 & 153; DADAY: *valida*, Lucas, Teneriffe, pp. 66-68; *dalmatica*, n. var. *africana*, Gad[b?]es; VERHOEFF (1).

*Cormocephalus willsii*, n. sp., Madagascar, pp. 63 & 64; *cupipes*, n. sp., Natal, pp. 64 & 65, pl. iv, fig. 8; *inermipes*, n. sp., Ceylon, pp. 65 & 66, pl. iv, fig. 9; *dentipes*, n. sp., Bengal, pp. 66 & 67, pl. iv, fig. 10; *lævipes*, n. sp., Lord Howe Is., pp. 67 & 68; Pocock (2).

*Cupipes gervaisianus* (Koch), syn. *C. græcus*, Kohl., p. 53; *gildingii* (Newp.), syn. *Otostigma cormocephalinum*, Pocock, pp. 53 & 54; *id.* (2): *armatus*, n. sp., N. S. Wales, p. 144; DADAY.

<sup>1</sup>*Arthrorhabdus*, n. g., pp. 221 & 222, *formosus*, n. sp., Port Elizabeth, pp. 222 & 223, pl. v, fig. 1; Pocock (2).

<sup>1</sup>*Pithopus*, n. g., syn. *Rhoda*, Meinert, nom. preocc., p. 223; *inermis*, n. sp., Iguarassu, pp. 223 & 224, pl. v, fig. 2; *calcaratus*, n. sp., Bahia, pp. 224 & 225, pl. v, fig. 2; *id.* (2).

<sup>1</sup>*Pseudocryptops*, n. g., pp. 225 & 226, *walkeri*, n. sp., Perim I., pp. 226 & 227, pl. v, fig. 3; *id.* (2).

<sup>1</sup>*Paracryptops*, n. g., p. 227, *weberi*, n. sp., Flores, p. 227; *id.* (2).

*Cryptops fecæ*, n. sp., Palon, pp. 420 & 421; *doriæ*, n. sp., Burma, pp. 421 & 422; *id.* (1): *atlantis*, n. sp., Madeira, pp. 155 & 156, pl. xii,

fig. 12 ; *spinipes*, n. sp., Sydney, pp. 156 & 157; *setosus*, n. sp., New Zealand, pp. 157 & 158 ; *cupivaræ*, n. sp., Brazil, pp. 158 & 159 ; *id.* (3).

*Otocryptops punctatus*, n. sp., Corea, pp. 159 & 160 ; *id.* (3).

*Scolopocryptops longiceps*, n. sp., Brazil, pp. 160 & 161 ; *id.* (3) : *quadrisulcatus*, n. sp., Caraccas, p. 144 ; DADAY.

*Newportia ernsti*, n. sp., Caraccas, pp. 161-163; *brevipes*, n. sp., Demerara, pp. 163 & 164 ; POCKOCK (3).

#### GEOPHILIDÆ.

Synopsis of genera, pp. 384-386 ; COOK & COLLINS.

*Schendyla* characterised, p. 386 ; *nemorensis* (C. K.), New York, pp. 386-388 ; *id.*

*Pectiniunguis* characterised, pp. 388 & 389 ; *americanus*, Bollm., Pichilingue Bay, Gulf of California, pp. 389-391, pl. xxxiii, figs. 1-5, pl. xxxiv, figs. 6-8 ; *id.*

\**Escaryus*, n. g., pp. 391 & 392, *phyllophilus*, n. sp., New York, pp. 392-394, pl. xxxiv, figs. 9-11, pl. xxxv, figs. 12-15 ; *liber*, n. sp., New York, pp. 394 & 395, pl. xxxv, figs. 16 & 17 ; *id.*

*Henia athenarum*, n. sp., Athens, pp. 215 & 216, pl. xii, fig. 1 ; POCKOCK (4).

*Geophilus grantii*, n. sp., Madeira, pp. 216 & 217, pl. xii, fig. 2 ; *challengeri*, n. sp., St. Vincent, Cape Verde, pp. 217 & 218, pl. xii, fig. 3 ; *parthorum*, n. sp., Samarkand, pp. 218 & 219, pl. xii, fig. 4 ; *sydneyensis*, n. sp., Port Jackson, pp. 219 & 220, pl. xii, fig. 5 ; *laticeps*, n. sp., King I. (Bass Strait), pp. 220 & 221, pl. xii, fig. 6 ; *morbosus* (Hutton), Wellington (N. Z.), pp. 221 & 222, pl. xii, fig. 7 ; *antipodum*, n. sp., Wellington (N. Z.), pp. 222 & 223, pl. xii, fig. 8 ; *huttoni*, n. sp., syn. *Himantarium ferrugineum*, Hutton, Wellington (N. Z.), pp. 223 & 224, pl. xii, fig. 9 ; *provocator*, n. sp., Wellington (N. Z.), pp. 225 & 226, pl. xii, fig. 10 ; *alacer*, n. sp., Straits of Magellan, pp. 226 & 227, pl. xii, fig. 11 ; *id.* (4).

*Mecistocephalus punctifrons*, Newp., Burma, syn. *gulliveri*, Butl., pp. 423 & 424 ; *castaneiceps*, Haase, Andamans, p. 424 ; *spissus*, Wood, Burma, pp. 424 & 425 ; *id.* (1).

*Orphnæus brevilabiatus* (Newp.), syn. *lineatus* (Newp.), Burma, pp. 425 & 426 ; *id.* (1).

*Himantarium meinertii*, Pocock, Burma, pp. 426 & 427, fig. ; *doriæ*, n. sp., Moulmein, pp. 427 & 428, fig. ; *id.* (1).

↓ *Himantosoma*, n. g., pp. 428 & 429, *typicum*, n. sp., syn. *indicum*, Pocock, nec Meinert, Moulmein, pp. 429-431 ; *porosum*, n. sp., Moulmein, pp. 431 & 432, fig. ; *id.* (1).

#### DIPLOPODA.

##### GLOMERIDÆ.

*Glomeris tyrolensis*, Latz., n. var. *helvetica*, Bonn, p. 165 ; notes on *G. marginata*, *conspersa*, *hexasticha*, and *pustulata*, pp. 155-160, figs. 47-49 ; *intermedia*, Latz., and *hexasticha*, Br., compared, p. 161 ; *intermedia*, n. var. *biguttata*, p. 161, *tenebrosa*, *transversosulcata*, pp. 162-163 ; VERHOEFF (2).

## POLYDESMIDÆ.

*Polydesmus eximius*, n. sp., Boscolungo (Appenines), pt. 59, No. 8; *dismilus*, n. sp., Florence, No. 9; BERLESE: *subinteger*, Latz., Rhine and Moselle, pp. 120, 121, & 123, fig. 2; *complanatus* (Linn.), Rhineland, pp. 120, 121, & 125; *denticulatus*, n. var. *germanicus*, Rhineland, &c., pp. 121-123, fig. 3; *rhenanus*, n. sp., Cochin and Treis, pp. 121 & 122, fig. 1; VERHOEFF (2).

*Brachydesmus mitis*, n. sp., Florence, pt. 59, No. 10; BERLESE: *superus*, Latz., n. var. *mosellanus*, Bonn., &c., pp. 125 & 126, fig. 7; VERHOEFF (2).

*Strongylosoma mediterraneum*, n. sp., Panormo and Palermo, p. 141, pl. vii, fig. 11; DADAY.

*Paradesmus gracilis* (C. Koch), Bonn, p. 126; VERHOEFF (2).

*Rhachis californicus*, n. sp., California, p. 142, pl. vii, fig. 12; DADAY.

## CHORDEUMIDÆ.

Synopsis of the genera *Atractosoma*, *Craspedosoma*, and *Chordeuma*, p. 133; VERHOEFF (2).

*Atractosoma carpathicum*, Latz., and *meridionale*, Fanz., pp. 126 & 127; *latzeli*, n. sp., S. England, pp. 127 & 128, figs. 4-6; *id.* (2).

*Craspedosoma rawlinsii*, Leach, n. var. *simile*, Bonn, &c., pp. 129 & 130; *id.* (2).

*Chordeuma silvestre*, C. Koch, Bonn, &c., pp. 130 & 131, fig. 10; *gallicum*, n. var. *rhenanum*, Bonn, &c., pp. 131-133, fig. 16; *id.* (2).

## JULIDÆ.

*Julus (Allaiulus) frisius*, n. sp., Norderney I., pp. 133-135, figs. 17-21; *fallax*, Mein., n. var., *longispinus*, Algau, p. 136, fig. 28; *silvarum*, Mein., syn. *gracilis*, Latz., Moselle, p. 136; *londinensis*, Leach, W. Europe, pp. 136-139, figs. 22-25; *albipes*, Koch, syn. *transverso-sulcatus*, Stein., W. Europe, &c., with n. vars. *cæruleus* and *dentatus*, Bonn, pp. 139-143, figs. 30, 33, & 36; *luridus*, C. Koch, with n. var. *meinerti*, fig. 35, Austria, Tyrol, compared with *silvarum*, Mein., N. France, Denmark, &c., pp. 143 & 144; *sabulosus*, Linn., Rhineland, pp. 144 & 145; *albolineatus*, Luc., Moselle, p. 146, n. var. *flavopictus*, Alps, pp. 145 & 146; *britannicus*, n. sp., S. England, pp. 147 & 148, figs. 41 & 42; *nitidus*, n. sp., Moselle, &c., pp. 148-150, figs. 43-45; *nanus*, Latz., n. var. *densestriatus*, Sieben-gebirge, pp. 150 & 151; synopsis of the preceding species, pp. 151-153; VERHOEFF (2).

*Isobates varicornis*, C. Koch, Bonn, p. 153; *id.* (2).

*Blaniulus guttulatus*, Gerv., from England, p. 153; *venustus*, Mein., pp. 153-155; *id.* (2).

*Spirostreptus sulcaticollis*, n. sp., Caraccas, pp. 136 & 137, pl. vii, figs. 1-3; *flavo-cingulatus*, n. sp., California, p. 137, pl. vii, fig. 4; *nitidus*, n. sp., Trinidad, pp. 137 & 138, pl. vii, fig. 5; DADAY.

*Spirobolus politus*, n. sp., East Indies, pp. 138 & 139, *cæruleo-limbatus*, n. sp., Queensland, p. 139, pl. vii, figs. 6 & 7; *virescens*, n. sp., Trinidad, p. 140, pl. vii, figs. 8-10; *id.*

## PROTRACHEATA.

DENDY, A. (1) Observations on the Australian Species of *Peripatus*.  
P. R. Soc. Vict. 1890, pp. 50-62.

One species only, *P. leuckarti*.

— (2) Preliminary account of a new Australian *Peripatus*. Vict.  
Nat. vi, pp. 173-176 (1890). Also in Ann. N. H. (6) vi, pp. 121-123.  
*P. insignis* from Macedon, Victoria.

— (3) An Oviparous Species of *Peripatus*. Nature, xlv, p. 468.

— (4) The reproduction of *Peripatus leuckarti*, Säger. Zool. Anz.  
xiv, pp. 461-463.

— (5) . . . . On the presence of Corpuscles in the Liquid discharged  
from the Apertures of the Nephridia and Oral Papillæ of *Peripatus*.  
P. R. Soc. Vict. iii, pp. 44 & 45 (1891).

SEDGWICK, A. An Oviparous Species of *Peripatus*. Nature, xlv,  
p. 494.



## INSECTA.

BY D. SHARP.

THE number of titles in this year's Record is 974, the number in 1890 being 927.

The most extensive additions to our knowledge of new forms continue to be made in faunistic works. Of these WHYMPER'S appendix (963) to his *Travels in the Andes* (962) merits special notice. Aided by the late H. W. Bates and several other entomologists, he has given us a volume devoted in larger part to Entomology, and illustrated by wood engravings of the best quality. The interest of the work is much increased by the fact that a considerable portion of the species described in it were found at a great elevation. In his preface Whympers mentions that at a spot in the environs of Quito he one day amused himself by "beating" the dwarf vegetation into his hat, and thus secured about thirty species of insects; although this frequented locality has been previously visited by Humboldt and Bonpland, by Buckley, Ida Pfeiffer, Reiss and Stübel, and others, yet it appears that all the thirty species thus obtained by Whympers were new, and that there were two new genera among them. It would be difficult to find a more convincing proof of the embryonic condition of descriptive Entomology than this fact.

We are indebted to LORD WALSLINGHAM (917) for the description and illustration of a large number of new species and genera of small moths from Tropical and Southern Africa, and also for another valuable memoir (918) relating to the *Lepidoptera* of the West Indian Islands. From the British Museum we have received another part of the Illustrations of *Lepidoptera*; this (369) has been prepared by Mr. G. F. HAMPSON, and relates, like the preceding part, to E. Indian forms. FAUVEL (275) has given us another instalment of his valuable, though too fragmentary, sketch of the *Coleoptera* of New Caledonia, a locality much neglected by Entomologists, though of great intrinsic interest. A fair amount of progress has been made with the *Insecta* in GODMAN & SALVIN'S *Biologia Centrali-Americana* (337).

In systematic work dealing with insects of the world, it will be noticed that BRUNNER V. WATTENWYL has published a supplement (107) to his

monograph of *Phaneropterides*, and that, although the monograph itself was published only thirteen years ago, the number of new genera and species in this supplement is very large. REDTENBACHER's monograph (687) of the *Conocephulides*—another subfamily of the *Locustidae*—likewise includes an extremely large proportion of novelties. ALBARDA's account (4) of the characters and synonymy of the *Raphidiides* is remarkable for the elaborate manner in which it is worked out. A very large number of new species of the Butterfly family *Hesperiidae* have been published in a somewhat unsystematic manner by MABILLE (549); it is doubtful whether such a work contributes in the long run to the progress of entomological knowledge to an extent at all adequate to the labour and industry that must have been expended on its production.

SCUDDER's Index (786) will doubtless be welcomed as a treasure by all who are interested in Palæoentomology.

FABRE has published a fourth volume (252) of his charming work on the habits and instincts of Insects, and a second edition (253) of his first volume has been produced. CHORBAUT has made an interesting though somewhat brief and imperfect contribution to the same subject, and has favoured the French people with five almost simultaneous editions of it (140–144). To EXNER we are indebted for another step in Insect-optics (251). He contributes to a knowledge of the structure of the outer parts, and discusses the function, concluding that the Insect optical organ is specially elaborated for perception of changes of position of objects external to itself, resultant from either their movements or those of its individual possessor.

GRABER has published another of his important papers on embryology (340); it deals with a variety of points in the earlier development of several genera of *Coleoptera*, *Orthoptera*, *Lepidoptera*, and *Hymenoptera*. CHOLODKOVSKY's paper on the embryology of *Blatta* is accompanied by a chapter of considerable general interest to zoologists. The entomological portion of KORSCHOLT & HEIDER's work (482) is a well-executed sketch of the present state of our knowledge of Insect development.

PETERSEN (648) has made a suggestive contribution on the subject of colour in the pupæ and cocoons of *Lepidoptera*; and BÜSGEN's paper on honey-dew and points of entomological interest connected therewith (114) is well worth perusal.

The Recorder has more than once taken the liberty of urging on Entomologists the importance of indicating definitely what portion of the synonymy they give in their works is new. Some writers already do so, and as there can be no doubt as to the advantage of the course they pursue, it would be well that their example should be more generally followed.

## I.—TITLES.\*

1. \*AARON, C. B., WEEKS, —, BEUTENMULLER, —. Dragon-flies v. Mosquitoes. New York: 1890.  
Essays on the subject of destroying Mosquitoes by Dragon-flies. Reviewed in *Nature*, xlv, p. 491.
2. ABELLE, E. DE P. *Malachides* d'Europe et pays voisins. *Ann. Soc. Ent. Fr.* 1891, pp. 115-230 & 405-446. [*Coleoptera*.]
3. —. Contributions aux *Buprestides* paléarctiques. *Rev. d'Ent.* x, pp. 257-288. [*Coleoptera*.]
4. ALBARDA, H. Revision des *Raphidides*. *Tijdschr. Ent.* xxxiv, pp. 65-184, pls. ii-xi. [*Neuroptera*.]
5. ALBERS, G. Ein neuer *Lucanide* von den Philippinen. *Deutsche z. Z.* 1891, p. 367. [*Coleoptera*.]
6. —. Ein neuer *Lucanide* aus der Gruppe der *Cladognathiden* von Java. *T. c.* pp. 76 & 77. [*Coleoptera*.]
7. ALFKEN, D. Mittheilungen über das Leben einiger *Apiden*: *Bombus*, *Andrena*, *Nomada*, und *Osmia*. *Verh. Deutsche Naturf.* 1890, ii, pp. 160-162. [*Hymenoptera*.]
8. —. Beiträge zur Insekten-Fauna der Nord-See-Insel Juist. *T. c.* pp. 136-142.
9. —. Erster Beitrag zur Insekten-Fauna der Nord-See-Insel Juist. *Abh. Ver. Brem.* xii, pp. 97-130.
10. ALLUAUD, C. *Coléoptères* recueillis aux Açores par M. J. de Guerne pendant les campagnes du Yacht l'Hirondelle. *Mém. Soc. Zool.* iv, pp. 197-207.  
Includes description of a new *Hydroporus* by RÉGIMBART.
11. —. Voyage de M. Ch. Alluaud aux Iles Canaries. (Travail destiné à servir de préface aux mémoires ultérieurs.) *T. c.* pp. 580-595, pl. xiv.
12. ALPHÉRAKY, S. On some cases of Dimorphism and Polymorphism among Palæarctic *Lepidoptera*. *Tr. E. Soc.* 1891, pp. 497-502.
13. ANDRÉ, ERNEST. Species des *Hymenoptères*. Pts. 38, 39, & 40.  
These parts commence two fresh vols., viz.: Vol. v., pp. 1-136, pls. i & ii, by the Rev. T. A. MARSHALL, continuing the *Braconides*; and Vol. vi, *Chrysidides*, by R. DU BUYSSON, pp. 1-88, pls. i & ii.
14. \*ANONYMOUS. An illustrated Handbook of British Dragon-flies. Birmingham.  
*Cf. Scot. Nat.* 1891, p. 194.

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\* An asterisk prefixed to a quotation indicates that the Recorder has not seen the Journal or Work referred to.

15. ARRIBALZAGA, FÉLIX LYNCH. *Dipterologia Argentina*. Rev. Mus. la Plata, i, pp. 345-377, & ii, pp. 131-174, pls. i-iv.  
A monograph of the Argentine *Culicidæ*.
16. —. *Dipterologia Argentina*. An. Soc. Arg. xxxii, pp. 80-99, 118-131, 194-202, 247-256, & 307-314.
17. —. Los *Dipteros*. *Op. cit.* xxviii, pp. 100-107.  
A popular article.
18. ASCHERSON, P. Die springenden Tamarisken-Früchte und Eichen-Gallen. Abh. Ver. Brem. xii, pp. 53-58. [*Hymenoptera*.]
19. ASHMEAD, W. H. Descriptions of some new Canadian *Braconidæ*. Canad. Ent. xxiii, pp. 1-7. [*Hymenoptera*.]
20. —. An *Encyrtid* with six-branched antennæ. Ins. Life, iii, pp. 455-457. [*Hymenoptera*.]
21. —. A generic synopsis of the *Coccidæ*. Tr. Am. Ent. Soc. xviii, pp. 92-102.
22. ATKINSON, E. T. Catalogue of the *Insecta* of the Oriental Region. No. 4. Ordo *Coleoptera*. J. A. S. B. lix, Part II, Supp. pp. 127-265, and Index, i-xxv.  
Includes the families from *Dytiscidæ* to *Staphylinidæ*, inclusive.
23. AURIVILLIUS, C. Neue *Coleoptera Longicornia*, iii. Ent. Tidskr. xii, pp. 97-106.
24. —. Verzeichniss einer vom Herrn Fritz Theorin aus Gabun und dem Gebiete des Camerunflusses heimgebrachten Schmetterlings-Sammlung. T. c. pp. 193-228. [*Lepidoptera*.]  
Accompanied by three plates, most of the figures on which are of *Heterocera*, but no reference is made to these in the paper itself.
25. —. Die mit *Oxyopisthen* Thomson verwandten, afrikanischen Gattungen der *Calandriden*. Cefv. Ak. Förh. 1891, pp. 361-371. [*Coleoptera*.]
26. BAKER, G. T. Notes on the genitalia of a gynandromorphous *Eronia hippia*. Tr. E. Soc. 1891, pp. 1-6, pl. i. [*Lepidoptera*.]
27. —. Notes on the *Lepidoptera* collected in Madeira by the late T. Vernon Wollaston. T. c. pp. 197-221, pl. xii.
28. \*BALLARD, J. P. Among the Moths and Butterflies. New York: 1890, 237 pp. [*Lepidoptera*.]  
A popular work. See Canad. Ent. xxiii, p. 44.  
BALY, J. S. [See GAHAN (310).]
29. BARRETT, C. G. *Gelechia (Anacampsis) sparsiciliella*, n. sp. Ent. M. M. (2) ii, p. 7.
30. BARTLETT-CALVERT, W. Some new, &c., *Lepidoptera* from Chili. T. c. pp. 312-317.

31. BATAILLON, E. Rôle du noyau dans la formation du reticulum musculaire fondamental chez la larve de Phrygane. C.R. cxii, pp. 1376-1378.  
Summary in J. R. Micr. Soc. 1891, p. 461.
32. BATELLI, A. Di una particolarità nell'integumento dell'*Aphrophora spumaria*. Monit. Zool. Ital. ii, pp. 30 & 32.
33. BATES, F. *Heteromera* in *Coleoptera* of second Yarkand Mission, pp. 55-79, pl. ii.  
Published in 1890, but omitted from that year's RECORD.
34. BATES, H. W. *Coleoptera* from Kulu in N.-W. India. Ent. xxiv, Supp. pp. 7-22.
35. —. *Coleoptera* collected by Mr. Pratt on the Upper Yang-tsze, and on the borders of Tibet. Second notice. Journey of 1890. T. c. pp. 69-80.
36. —. *Geodephaga* and *Longicornia* in scientific results of the second Yarkand Mission. *Coleoptera*, pp. 1-36.
37. —. Additions to the *Carabideous* fauna of Mexico, with remarks on some of the species previously recorded. Tr. E. Soc. 1891, pp. 223-278, pls. xiii & xiv. [*Coleoptera*.]
38. —. Note on three Australian *Carabidæ*. Ent. M. M. (2) ii, pp. 285-287. [*Coleoptera*.]
39. —. List of the *Carabidæ* obtained by Père Cardon in Chota-Nagpore. C.R. Ent. Belg. xxxv, pp. cccxiv-cccxxxix. [*Coleoptera*.]
40. —. New Longicorn *Coleoptera*, chiefly from Mexico. Ent. M. M. (2) ii, pp. 158-161.  
— [See also WHYMPER (963).]
41. BATESON, W. On the nature of supernumerary appendages in Insects. P. Camb. Phil. Soc. vii, p. 159.
42. —. On Variations in the Colour of Cocoons (*Saturnia carpini* and *Eriogaster lanestris*), with reference to recent theories of protective coloration. T. c. p. 251.
43. BAUDI, F. Di un *Bembidide* cieco del G. *Dichropterus*, Ehlers. Nat. Sicil. x, p. 77. [*Coleoptera*.]
44. BECKER, TH. Neues aus Süd-Tirol und Steiermark. Ein *Dipterologischer* Beitrag. Wien. ent. Z. x, pp. 281-288, pl. iii.
45. —. Neues aus der Schweiz. T. c. pp. 289-296. [*Diptera*.]
46. BEDEL, L. Faune des *Coléoptères* du bassin de la Seine. Tome v, pp. 105-136.
47. —. Description de deux *Coléoptères* nouveaux du Nord de l'Afrique. Bull. Soc. Ent. Fr. 1891, pp. xxxvii & xxxviii.

48. [BEDEL, L.] Synopsis de Coléoptères européens. *Cryptophagidae*. L'Ab. xxvii, pp. 161-234.  
A translation, with original notes, of Reitter's tables, &c.
49. BELON, M. J. Description d'une espèce nouvelle du genre *Lathridius*, Herbst. C.R. Ent. Belg. xxxv, p. cxxxiv. [*Coleoptera*.]
50. —. Genre nouveau de *Longicorne*. Bull. Soc. Ent. Fr. 1891, p. liv. [*Coleoptera*.]
51. BERG, C. Enumeracion sistematica y sinonimica de los Formicidos argentinos, chilenos y uruguayos. An. Soc. Arg. xxix, pp. 5-43. [*Hymenoptera*.]
52. —. Sobre la *Carpocapsa saltitans*, Westw., y la *Grapholitha motricæ*, Berg., n. sp. Op. cit. xxxi, pp. 97-110. [*Lepidoptera*.]
53. —. Nova *Hemiptera* faunarum Argentinae et Uruguayensis. Op. cit. xxxii, pp. 164-175, 231-243, 247-256, & 277-287.
54. —. *Dyscophus onthophagus* un nuevo grillo uruguayo cavernícola. T. c. pp. 5-8. [*Orthoptera*.]
55. BERGROTH, E. On the new Australian Vine Pest. Ent. M. M. (2) ii, pp. 68-70. [*Rhynchota*.]
56. —. Additions au "Catalogue méthodique des *Elaterides* connus en 1890 par E. Candèze." C.R. Ent. Belg. xxxv, pp. ccxxxiii-ccxxxvii. [*Coleoptera*.]
57. —. Eine neue *Saldiden*-Gattung. Wien. ent. Z. x, pp. 263-266. [*Rhynchota*.]
58. —. Description d'une nouvelle espèce du genre *Leptopus*, Latr. Bull. Soc. Ent. Fr. 1891, p. cli. [*Rhynchota*.]
59. —. Contributions à l'étude des *Pentatomides*. Rev. d'Ent. x, pp. 200-235. [*Rhynchota*.]
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The entomological contents of these eight parts published in 1891 are as follows:—

*Coleoptera*, vol. ii, pt. 1, pp. 337–440, pls. xi & xii: *Nitidulidæ*, *Trogositidæ*, *Synteliidæ*, by D. SHARP.

Vol. iv, pt. 2, pp. 257–368, pls. xi–xvi: *Mordellidæ*, *Rhipidophoridæ*, *Meloidæ*, by G. C. CHAMPION.

Vol. iv, pt. 3, pp. 81–168, pls. iv–vi: *Curculionidæ*, by D. SHARP.

Vol. vi, pt. 1, supp. pp. 233–312, pl. xli: *Chrysomelidæ*, by M. JACOBY.

Vol. vii, pp. 145–160, pl. viii: *Endomychidæ*, *Coccinellidæ*, by H. S. GORHAM.

*Hymenoptera*, vol. ii, pp. 129–176, pls. viii–x: *Cerceris* to *Priocnemis*, by P. CAMERON.

*Lepidoptera-Rhopalocera*, by F. D. GODMAN & O. SALVIN, pls. lxxi & lxxii.

*Lepidoptera-Heterocera*, vol. i, pp. 441–490, and vol. ii, pp. 1–24, pls. xxxv–xliii: *Deltoidæ* to *Geometridæ*, by H. DRUCE.

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962. WHYMPER, E. Travels amongst the Great Andes of the Equator. London : 1892.

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963. —. Supplementary Appendix to Travels amongst the Great Andes of the Equator. London : 1891, 8vo, xxii & 147 pp.

A legal publication was made in 1891, but the work was not to be purchased till March 26, 1892. The Insects occupy pp. 1-120, and are by the following contributors :—

- Colcoptera*. H. W. BATES, pp. 7-39.  
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 " H. S. GORHAM, pp. 44-58.  
 " A. S. OLLIFF, pp. 58-81.  
 " M. JACOBY, pp. 82-88.  
*Hymenoptera*. P. CAMERON, pp. 89-95.  
*Lepidoptera Rhopalocera*. F. D. GODMAN & O. SALVIN, pp. 96-110.  
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## II.—ANATOMY, PHYSIOLOGY, BIOLOGY.

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### 2. NERVOUS SYSTEM, ORGANS OF SENSE, AND PSYCHOLOGY.

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### III.—FAUNISTIC AND PALÆONTOLOGY.

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*Thysanura.* N. sp., PARFITT (645).

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*Hymenoptera*. Devon, PERKINS, Ent. M. M. (2) ii, p. 194; SWALE, Ent. M. M. (2) ii, p. 24; ROTHNEY, Ent. M. M. (2) ii, p. 78.—Ilfracombe, SAUNDERS, Ent. M. M. (2) ii, p. 308.—Wiltshire, PERKINS, Ent. M. M. (2) ii, p. 79.—Wootton-under-Edge, PERKINS, Ent. M. M. (2) ii, p. 276.—Box Hill, BILLUPS, Ent. xxiv, p. 174, and Ent. M. M. (2) ii, pp. 195 & 196.—Chobham, SAUNDERS, Ent. M. M. (2) ii, p. 249.—Rugby, MORICE, Ent. M. M. (2) ii, p. 276.—Lowestoft, MORICE, Ent. M. M. (2) ii, p. 276.—York, HEWETT, Ent. xxiv, p. 248.—Bibliographic list relating to papers and records about *Hymenoptera* of the North of England from 1884–1889, in Naturalist, 1890, pp. 39–42.—Dumfries, SERVICE, Scot. Nat. 1891, p. 41.—Dublin, LEECH, Ent. xxiv, p. 248.

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*Orthoptera.* The *Orthoptera* of West Cornwall, DALE, Rep. Penzance Soc. 1890-1, p. 267.



(d.) *North Europe and Siberia* [see also (a.) and (b.)].

*Insecta.* THOMSON (858).—Norway, WALKER, p. xxii, P. E. Soc. 1891.—Fjällnäs i Härjedalen, GRILL, Ent. Tidskr. xii, pp. 145–157.

*Coleoptera.* Norway, HELLIESEN (382); SCHÖYEN, Ent. Tidskr. xii, p. 1.—Sweden, VARENIUS (890).—Siberia, PIC (652).

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*Thysanura.* Norway, SCHÖTT (776).

(e.) *Central and Eastern Europe* [see also (a.) and (b.)].

*Insecta.* STIERLIN (847).—I. of Juist, ALFKEN (8, 9).—I. of Spiekerrooge, POPPE, Abh. Ver. Brem. xii, pp. 60–63.—Helgoland, METZGER (579).—*Dipterous* galls of Lorraine, KIEFFER (465); *Hymenopterous* galls (466).

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*Neuroptera.* Germany, *Psocide*, TETENS (855).—Kharkoff, RODZIANKO (743).—*Thysanura* of the Tyrol, DALLA-TORRE (173).

(f.) *France* [see also (a.) (b.) and (g.)].

*Insecta.* FAUVEL (272).

*Coleoptera.* BEDEL (46); BRISOUT (97); FAUVEL (271, 273); GUILLEBEAU (358); ODIER, Bull. Soc. Ent. Fr. 1891, p. lxxxix; BILLECOQ,

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(g.) *Southern Europe and Mediterranean Basin* [see also (a.) and (b.)].

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*Hymenoptera.* COSTA (161); MOCSÁRY (596); STEFANI (844); TOURNIER (860).—Spain, MEDINA (573); Barcelona, PEREZ, Act. Soc. L. Bord. xlv, pp. 199 & 200.—Catalogo provisional de las hormigas de Andalucía, MEDINA, An. Soc. Esp. xx, pp. 92–104.—Algeria and Gibraltar, CAMERON (129); FERTON (277, 278); PEREZ, Act. Soc. L. Bord. xlv, p. 198.—Tunis, EMERY (242).—Triest, FRIESE (304).—Dalmatia, GASPERINI (323).

*Lepidoptera*. JOANNIS (443) ; WALSINGHAM (921).—Apennines, NORRIS, Ent. xxiv, p. 227.—Sicily, PÜNGELER, Nat. Sicil. xi, pp. 17–23, and RAGUSA, Note Lepidotterologiche, t. c. p. 95.—Corfu, NORRIS, Ent. xxiv, p. 179.—Malta, CARUANA-GATTO, Rev. Ital. Sci. Nat. xi, pp. 75, &c., and Med. Nat. i, p. 85.—Dalmatia, REBEL (685) ; Algeria, MEYRICK (585).—Syria, CALBERLA (126) ; CHRÉTIEN (149).

*Diptera*. GIGLIO-TOS (330).—Pavia, BEZZI (63).—Venice, MIK (591 & 593).—Zante, RÜDER, Ent. Nachr. xvii, p. 81.

*Rhynchota*. HORVATH (413) ; REY (714).—Sicily, RAGUSA, Nat. Sicil. x, pp. 206–209.—Greece, REUTER (708).—Suez, REUTER (712).—Russian Armenia, HORVATH (414).

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*Orthoptera*. Sicily, RIGGIO (719).—Rome, MESSEA (578).—N. Africa, KIRBY (474) ; PICTET & SAUSSURE (656).—Egypt, REDTENBACHER (687).

#### (h.) *Caucasus and West and Central Asia*

[see also (a.) and (b.).]

For Kashmir, see Asia.

*Insecta*. S. Caspian, CHRISTOPH (150).

*Coleoptera*. Caucasus, ROST (750, 751, 752) ; TSCHITSCHÉRINE (881).—Caucasus and Armenia, GANGLBAUER (317).—Turkestan, HORN (408) ; KOSCHANTSCHIKOFF (484) —W. Asia, FAUST (268) ; REITTER (697, 698, 700, 701, 705).—Centr. Asia, SEMENOW (797).—Chinese Turkestan, SEMENOW (795).—Thibet, JACOBY (435).—Yarkand, F. BATES (33), SHARP (806).—Arabia, NONFRIED (626).

*Hymenoptera*. W. Asia, GRIBODO (348, 349) ; SEMENOW (796).—Ararat, RADOSZKOWSKI (673).—Transcaspian region, SEMENOW (798, 799).—Centr. Asia and Mongolia, *Chrysidide*, RADOSZKOWSKI (678).—Mongolia, BUYSSON (125).—Arabia, KONOW (480).

*Lepidoptera*. Central Asia, GROUM-GRSHIMAILO (355).

*Rhynchota*. HORVATH (412).

#### 4. AFRICA (ETHIOPIAN REGION).

For Arabia, see 3 (h.).

*Insecta*. MEYER (580) ; MONTEIRO (598).

*Coleoptera*. AURIVILLIUS (23, 25) ; BUYSSON (122) ; DESBROCHERS (179) ; DOHRN (203, 204) ; DUVIVIER (221) ; FAIRMAIRE (254, 258, 259, 263) ; GAHAN (312, 313) ; JACOBY (435) ; KERREMANS (462, 463) ; KOLBE (479) ; KRAATZ (486, 489) ; LEFÈVRE (516, 519) ; LEWIS (530) ; NONFRIED (624) ; QUEDENFELDT (670) ; RÉGIMBART (689, 690) ; ROELOFS (744, 746) ; SRNKA (836) ; TSCHITSCHÉRINE (879) ; WASMANN (934) ; WATERHOUSE (939) ; WEISE (951, 952, 956).

*Hymenoptera.* BUYSSON (125); EMERY (241); FOX (298); GRIBODO (348, 349); KOHL (478); MOCSÁRY (596); SAUSSURE (760, 761); SCHLETTERER (772).

*Lepidoptera.* AURIVILLIUS (24); BUTLER (117); DOGNIN (192); DRUCE (212, 213); HAMPSON (369, p. 46, and 370); HEYLAERTS (389); HOLLAND (398); KARSCH (445, 446); KIRBY (467); MABILLE (549, 550, 551, 552, 553); MABILLE & VUILLOT (554); RAGONOT (680); ROGENHOFER (747, 748); SAALMÜLLER (759); SHARPE (803, 809, 810).—On a collection of *Lepidoptera* from Bangala, SHARPE, Deutsche e. Z., Lep. iv, pp. 53–60.—SMITH & KIRBY (820); STAUDINGER (840); TRIMEN (874, 875); VUILLOT (907, 908, 909, 910); WALSINGHAM (917, 919); WARREN (925).

*Rhynchota.* BERGROTH (59); FALLOU (265); KARSCH (447, 448); SIGNORET (812).

*Diptera.* BIGOT (64, 69).

*Neuroptera.* GERSTÄCKER (825); KARSCH (450, 453, 455); McLACHLAN (557).

*Orthoptera.* BRUNNER (107); COSTA (161); KARSCH (459, 460); KIRBY (470, 472, 473).—Is. of São Thomé and Rolas, KRAUSS (493).—PICTET & SAUSSURE (656); REDTENBACHER (687).

## 5. MADAGASCAR.

*Coleoptera.* BRENSKE (89); DUVIVIER (221); Seychelles, FAIRMAIRE (257, 262); JACOBY (435); KERREMANS (462); KUWERT (505); LEWIS (530); NONFRIED (624); POUJADE (662); RÉGIMBART (690); SCHAUFUSS (767, 768); SCHWARZ (782); TSCHITSCHÉRINE (879); WASMANN (929); WATERHOUSE (939).

*Hymenoptera.* SAUSSURE (760, 761).

*Lepidoptera.* MABILLE (549, 552); RAGONOT (680); SAALMÜLLER (759); SMITH (818, 819); WARREN (925).

*Rhynchota.* BERGROTH (58, 59); FALLOU (265).

*Neuroptera.* SELYS (794).

*Orthoptera.* BRUNNER (107); KARSCH (458); KIRBY (471); REDTENBACHER (687); SAUSSURE (762).

## 6. TROPICAL AND EASTERN ASIA, WITH JAPAN.

For Central Asia and Mongolia, and for Arabia, see also 3 (h.).

*Insecta.* COTES (162).

*Coleoptera.* Oriental region, Catalogue, ATKINSON (22); F. BATES (33); BATES, India (34, 39); *id.*, W. China (35); BOURGEOIS, India (84); *id.*, Indo-China (85); BRENSKE, India (92); CHAMPION, Japan (136); DECAUX, Siam (175); DESBROCHERS, E. India (179); DOHRN, India (204); DUVIVIER, India (221, 222); FAIRMAIRE, Kashmir (260); *id.*, China (261); FAUST (267, 270); FRITZE, Yezo (305), GAHAN (312, 313), GORHAM (338); GROUVELLE, India (354); HELLER (379, 380), JACOBY (434, 436); KERREMANS, Andaman Is. (462), LEFÈVRE (516, 518); LESNE, Cochin China (522, 523), LEWIS (530); *id.*, India (531); *id.*, Burma (532);

*id.*, Japan (534, 535, 536, 537), NONFRIED (624); POLL & KANNEGIETER, Ceylon (660), RAFFRAY (679), RÉGIMBART (690); REITTER, Japan (694); RITSEMA, Burma (734); SCHOENFELDT, Japan, Catalogue (775); SCHWARZ, Pekin (781), SEMENOW (797); SENNA, Penang (802); SHARP, Yarkand (806); *id.*, Japan (804, 805), WATERHOUSE (939); WEISE, India (951).

*Hymenoptera.* CAMERON (129, 130), EMERY (241), GRIBODO (348, 349); SAUSSURE, India (760, p. 87, note; 761, p. 269).

*Lepidoptera.* *Rhopalocera* occurring in E. Asia and Britain, SOUTH (834).—BUTLER, India (118); Indian silk insects, COTES (163); CROWLEY, Burma (170); DOHERTY, Perak (199, p. 176); *id.* India (197); ELWES (239); FERGUSON, Travancore (276); HAMPSON, Nilgiri (369); LEECH (515) and China (512, 513, 514); MABILLE (549); MOORE, E. India (600, 601); NICÉVILLE, India (620); OBERTHUR (628, 629); POUJADE, Laos (663, 664, 665, 666, 667); RAGONOT (680, 681); SMITH & KIRBY (820); SWINHOE, India (851, 852); WALSINGHAM (919); India, sp. withdrawn, WALSINGHAM, P. Z. S. 1891, p. 532; WALSINGHAM, Ceylon (920); WARREN (925); WATSON, India (941, 942).

*Diptera.* BIGOT (65, 66, 67, 68, 69, 70).

*Rhynchota.* BERGROTH (59); DISTANT (186, 188); FALLOU (265); KIRBY, Ceylon, Catalogue (468); LETHIERRY (524, 525); E. India *Coccide*, MASKELL (566).

*Neuroptera.* KARSCH, Sikkim (455); KIRBY, Ceylon (469); MAC LACHLAN (556, 557).

*Orthoptera.* BONNET, Japan, Le Nat. 1891, p. 192.—BRUNNER (107); E. Indian Locusts, COTES (165); *id.* (166); KIRBY (470); PICTET & SAUSSURE (656); REDTENBACHER (687); WOOD-MASON (968).

## 7. ASIATIC ARCHIPELAGO, INCLUDING PAPUA.

*Insecta.* I. of Billiton, RITSEMA, Notes Leyd. Mus. xiii, p. 131.

*Coleoptera.* ALBERS, Java (6); *id.* Philippines (5); AURIVILLIUS, Philippines (23); CANDÈZE (131); DESBROCHERS, Java (179); DOHRN, Java (200); *id.* Borneo, Sumatra (201); DUVIVIER, Java (221); FAUST, Java (270); *id.* Sumatra (267); GAHAN (312, 313); HELLER (380); *id.* Philippines (381); JACOBY (435, 436); KANNEGIETER, Java (444); KERREMANS (462); KRAATZ, Java (490); LEFÈVRE (516); LEWIS (530); NONFRIED (624); RAFFRAY, Philippines (679); RÉGIMBART (690); RITSEMA, Java (730, 732); *id.* Borneo (733); *id.* Sumatra and Nias I. (731); ROELOFS (744); *id.* Philippines (745); SCHAUFUSS, Philippines (765); SENNA (802); WEISE, Key Is. (951).

*Hymenoptera.* GRIBODO (348, 349), MOCSÁRY (596), TASCHENBERG (853).

*Lepidoptera.* DOHERTY, Engano (198); *id.*, Sumba and Sambawa (199), DRUCE (212), HEYLAERTS (390); HOLLAND, Celebes (397); HONRATH, Borneo (401), MABILLE (549); MISKIN, S. E. New Guinea (595); NICÉVILLE, Java, Borneo (620); RAGONOT, Borneo (680), SEMPER (801); SNELLEN, Billiton (828); *id.*, Oby I. (829); STAUDINGER (840).

*Diptera.* BIGOT, Java (69), and WULP, Tijdschr. Ent. xxxiv, pp. cxxiii & cxxiv.

*Rhynchota.* BERGROTH (57, 59), DISTANT (186); *id.*, Borneo (188), FALLOU (265); REUTER, Java (711), TSCHIRCH (877).

*Neuroptera.* KARSCH (455); *id.*, Java (456); *id.*, Sumatra (451); SELYS, Philippines (793).

*Orthoptera.* BRUNNER (107); KARSCH, Sumatra (457), KIRBY (470, 472), PICTET & SAUSSURE (656), REDTENBACHER (687).

## 8. AUSTRALIA AND TASMANIA.

*Insecta.* WALKER, Port Darwin (915).

*Coleoptera.* BATES (38), BLACKBURN (73, 74, 75), CHAMPION (136), GAHAN (312, 313), KERREMANS (462), LEWIS (530), NONFRIED (624), TSCHITSCHÉRINE (880).

*Hymenoptera.* BUYSSON (125), CAMERON (129), FROGGATT (307); *id.*, Catalogue of described Australian *Hymenoptera* (306), TASCHENBERG (853).

*Lepidoptera.* MURRAY I., CARPENTER, P. Publ. Soc. vii, pp. 1-4; DRUCE (211); DURRANT (220); LUCAS (545); MABILLE (549); MEYRICK (581, 582); Catalogue of *Rhopalocera*, MISKIN (594); OLLIFF (631); SCOTT (784); TEPPER (854); WARREN (925).

*Diptera.* OLLIFF (635).

*Rhynchota.* BERGROTH (55, 59); Pelagic *Hemiptera*, SKUSE (816); *Coccida*, MASKELL (567, 568); OLLIFF (635).

*Mallophaga.* NEUMANN (612, 613).

*Orthoptera.* BRUNNER (107); KARSCH (458); KIRBY (470, 472); PICTET & SAUSSURE (656); REDTENBACHER (687).

## 9. NORTH AMERICA.

*Insecta.* GARMAN, Illinois (319); GODMAN & SALVIN (337); HUBBARD, Yellowstone Park (420).—*Pediculi* and *Mallophaga*, OSBORN (640).—Labrador: list of insects of, in The Labrador Coast, by PACKARD, New York, 1891, pp. 386-396.—SCHWARZ, Great Salt Lake (777).

*Coleoptera.* DIETZ (185); HAUSEN (376, 377, 378).—Bibliography of local lists of N. Am. *Coleoptera*; HAMILTON & HENSHAW (368).—HORN (402, 403, 404, 405); LENG (520); SCHWARZ, (778) and P. E. Soc. Wash. ii, p. 39; WEISE, Florida (951).—List of blind *Coleoptera*, SCHWARZ (780).—The tiger-beetles of California, DUNN, Zoe, ii, pp. 152-154.—Queen Charlotte I., KEEN, p. 282, Canad. Ent. xxiii.—Vancouver I., FLETCHER, Canad. Ent. xxiii, p. 283.—Canada, HARRINGTON, Canad. Ent. xxiii, p. 115; *Rhynchophora*, HARRINGTON, Canad. Ent. xxiii, pp. 21-26 & 114.—Montreal, HAUSEN, Canad. Ent. xxiii, pp. 102 & 103.—Pinal Mountains, WICKHAM, Ent. News, ii, pp. 130-133.—Lower California, RIVERS (736).

*Hymenoptera.* ASHMEAD (19); BUYSSON (125); EISEN (237); FOX (295, 297, 299); FYLES, *Canad. Ent.* xxiii, p. 135; GILLETTE (335); HARRINGTON (373); HOWARD (417); MARLATT (562); RILEY & MARLATT (727); ROBERTSON (739).

*Lepidoptera.* DRUCE, *Ent. News*, ii, pp. 190-192; DYAR (224, 225); EDWARDS (234, 235, 236); FERNALD (279); HOLLAND (399), and *id.*, *Canad. Ent.* xxiii, p. 16; HUDSON (421, 422); LUGGER (546); MAYNARD (570); MURTFELDT (607); NEUMOEGEN (614, 615); RILEY (724); SKINNER (814); SMITH (821, 822, 823, 824, 825); TAYLOR, *Canad. Ent.* xxiii, p. 15; WALSINGHAM (918, 923, 924); WARREN (925); WRIGHT (970).—Canada, MOFFATT, p. 167, *Canad. Ent.* xxiii.—Long I., KUNZE, *Ent. News*, ii, p. 171.—Montreal, WINN, *Canad. Ent.* xxiii, pp. 96-98.—Quebec, WINN, *Canad. Ent.* xxiii, pp. 10-13.—*Lepidoptera* taken at electric lights in Brooklyn, OTTOLENGUI, *Ent. News*, ii, pp. 23-27.—List of the *Macro-Lepidoptera* of Buffalo and vicinity, DUZEE, *Bull. Buff. Soc.* v, pp. 105-166.—Species attracted by electric light at Poughkeepsie, DYAR (227), and *Ins. Life*, iii, pp. 322-325.—Philadelphia, JOHNSON, *Ent. News*, ii, p. 65.—Lower California, WEEKS (946, 947).

*Diptera.* COQUILLETT (155, 156, 157, 158); SNOW (832); TOWNSEND (862, 863, 864, 865, 866, 867, 870, 871, 872, 873).

*Rhynchota.* BERGROTH (59); California, *Coccidae*, COQUILLETT (160); DOUGLAS, *Coccidae* (207); DUZEE (223); UHLER (885, 886, 887); WEED, *Aphididae* (944).—Southern Michigan, TOWNSEND, *P. E. Soc. Wash.* ii, pp. 52-56.

*Neuroptera.* ALBARDA (4); McLACHLAN (557).—*Odonata* of Maine, HARVEY, *Ent. News*, ii, pp. 50 & 73-75.—*Odonata* of Manchester, WADSWORTH, *Ent. News*, ii, p. 11.—*Thysanura*, MACGILLIVRAY (555).

*Orthoptera.* BRUNER (104); KIRBY, Bermuda (470); McNEILL (558); REDTENBACHER (687).—*Acridiidae* of Indiana, BLATCHLEY, *Canad. Ent.* xxiii, pp. 74-81 & 98-100.

## 10. CENTRAL AMERICA, INCLUDING MEXICO.

*Insecta.* GODMAN & SALVIN (337).

*Coleoptera.* BATES (37, 40); BELON (50); DESBROCHERS (180); DUGÈS (218); LEWIS (529, 530); NEVINSON (616); NONFRIED (623, 624); SCHAUFUSS (767).

*Hymenoptera.* BUYSSON (125); GRIBODO (348, 349).

*Lepidoptera.* MABILLE (549); RAGONOT (680).

*Diptera.* GIGLIO-TOS (333, 334); TOWNSEND (869, 870).

*Rhynchota.* DISTANT (187); FALLOU (265).

*Neuroptera.* KARSCH (455).

*Orthoptera.* BRUNNER (107); KIRBY (470); REDTENBACHER (687).

## 11. ANTILLES.

*Insecta.* Jamaica, COCKERELL, *J. Inst. Jamaica*, i, pp. 31 & 33.

*Coleoptera.* LEFÈVRE (516); NONFRIED, Haiti (624); WEISE, Cuba (951).



- Hymenoptera.* FOX, Jamaica (296).  
*Lepidoptera.* GUNDLACH, Cuba (361); *id.* Porto Rico (360); PLAXTON, Jamaica (659); WALSINGHAM (918).  
*Neuroptera.* CALVERT, Jamaica (127).  
*Orthoptera.* REDTENBACHER (687).—Bermuda, see N. America.

## 12. SOUTH AMERICA.

- Insecta.* BLANCHARD (77); GODMAN & SALVIN (337).  
*Coleoptera.* AURIVILLIUS (23); BATES (40); BELON (49); CANDÈZE (132) and pp. 329–332, *Ann. Soc. Ent. Fr.* 1891; DESBROCHERS (181); FAUVEL (274); FLEUTIAUX (283, 285); GAHAN (310, 311); GROUVELLE (353); HORN (407); LEFÈVRE (516, 517); LÉVEILLÉ (526); LEWIS (530); NONFRIED (624); RÉGIMBART (690); SHARP, Chili (807); WASMANN (934); WATERHOUSE (937, 938, 939); WHYMFER (963).—Uebersicht über eine *Coleopteren* Sammlung von Cordoba in Argentinien, FRENZEL, *Ent. Nachr.* xvii, pp. 326–333.  
*Hymenoptera.* ASHMEAD (20); BERG (51); BUYSSON (125); CAMERON (129); GRIBODO (348, 349); PÉREZ (646); SCHLETTERER, Chili (773); TASCHENBERG (853).  
*Lepidoptera.* Trinidad, see WALSINGHAM (918).—BARTLETT-CALVERT (30); BERG (52); DOGNIN (190 to 196); MABILLE (549); MABILLE & VUILLOT (554); OBERTHUR, *Bull. Soc. Ent. Fr.* 1891, p. lxi; RAGONOT (680, 681); STAUDINGER (840); WALSINGHAM (918, 919); WARREN (925).  
*Diptera.* ARRIBALZAGA (15, 16); Catalogue of *Asilidæ*, WILLISTON (965).  
*Rhynchota.* BERG (53); BERGROTH (59); FALLOU (265); Trinidad, *Coccidæ*, DOUGLAS (207).  
*Neuroptera.* KARSCH (449, 452, 454, 455); *Mallophaga*, NEUMANN (612, 613).  
*Orthoptera.* BERG (54); BRUNNER (107); KARSCH (461); *id.* Chili (458); KIRBY (470); REDTENBACHER (687).

## PALÆO-ENTOMOLOGY.

[*Cf.* BRONGNIART (98, 100), FÖRSTER (292), HAASE (365), OLIVIER (630), OPPENHEIM (637), SCHAUFUSS (766), SCUDDER (785, 786).]

Bibliography of fossil insects, SCUDDER (785).—Complete list of fossil insects, with full references; SCUDDER (786).

A work by FÖRSTER (292), said to include 122 n. spp., has not been seen by the Recorder.

Critical remarks on many species that have been supposed to be the earliest representatives of their orders will be found in HAASE's paper (365). This paper is discussed in detail by OPPENHEIM (637).

## COLEOPTERA.

*Prodytiscus*, *Pseudohydrophilus*, and *Sphenoptera sphinx* discussed ; HAASE, p. 26, N. Jahrb. Min. Pal. 1890, ii.

*Bryaxis patris*, Prussia, in amber, SCHAUFUSS, B. E. Z. xxxvi, p. 53, n. sp.

*Bythinus schaufussi*, n. n. for *caviceps*, Schauf., nec Reit. ; REITTER, p. 228, Wien. ent. Z. x.

† *Omositoidea*, n. g., *Nitidularum*, for *O. gigantea*, n. sp., from amber in Prussia ; SCHAUFUSS, p. 55, B. E. Z.

† *Cucomorphocerus*, n. g., *Telephoridarum*, p. 57, for *C. cerambyx*, n. sp., from amber in Prussia, p. 58 ; SCHAUFUSS, B. E. Z. xxxvi.

† *Enicotosoma*, n. g., *Cerambycidarum* ?, p. 58, for *E. doenitzi*, n. sp., from amber in Prussia, p. 60 ; SCHAUFUSS, B. E. Z. xxxvi.

† *Parmenops*, n. g., *Cerambycidarum*, p. 60, for *P. longicornis*, n. sp., from amber in Prussia, p. 61 ; SCHAUFUSS, B. E. Z. xxxvi.

† *Electrolema*, n. g., *Crioceridarum*, p. 62, for *E. baltica*, n. sp., from amber in Prussia, p. 63 ; SCHAUFUSS, B. E. Z. xxxvi.

## HYMENOPTERA.

*Pseudosirex* (*Rhipidorhabdus*, Opp.), discussed, with synonymy, &c. ; HAASE, pp. 27-32, pl. i, figs. 14 & 15, N. Jahrb. Min. Pal. 1890, ii, and OPPENHEIM, *op. cit.* 1891, i, pp. 53-57.

## LEPIDOPTERA.

*Ocnerites macroceraticus*, Opp, referred to *Phryganeidae* ; HAASE, p. 24, pl. i, fig. 12, N. Jahrb. Min. Pal. 1890, ii.

## RHYNCHOTA.

*Eocicada* and *Prolystra* discussed ; HAASE, pp. 16-20, pl. i, figs. 6 & 7, N. Jahrb. Min. Pal. 1890, ii.

Notes on fossil *Tettigidae* ; BUCKTON, Mon. Brit. *Cicadae*, ii, pp. 164-184.

## NEUROPTERA.

† *Osmylites*, n. g., for *Chrysopa protogaea*, Hag. ; HAASE, p. 22, pl. i, fig. 10, N. Jahrb. Min. Pal. 1890, ii.

† *Nymphites*, n. g., for *Heimerobius priscus*, Weyenb. ; HAASE, p. 23, and with *N. braueri*, n. sp., p. 24, pl. i, fig. 11, N. Jahrb. Min. Pal. 1890, ii.

Oppenheim's *Termes lithophilus* referred to *Mesosialis* (*Sialidae*) (an. n. g. ?) ; HAASE, p. 21, pl. i, fig. 9, N. Jahrb. Min. Pal. 1890, ii.

† *Gigantotermes*, n. g., for *Apochrysa excelsa*, Hag. ; HAASE, p. 13, N. Jahrb. Min. Pal. 1890, ii.

*Trichoptera* : cf. *Ocnerites*, sub *Lepidoptera*.

## ORTHOPTERA (?).

*Chesmoda obscura*, Germ., ordinal position discussed, with figs. ; HAASE, N. Jahrb. Min. Pal. 1890, ii, p. 3, pl. i, figs. 1-5.

## IV.—ECONOMIC.

Reports and Manuals ; FORBES (288), *Scolytus rugulosus*, *Euzophera semifuneralis*, *Lachnosterna* ; *Cecidomyia destructor* ; *Aphis maidi-radidis* ; diseases of the Chinch-bug are the points dealt with ; LINTNER (542) ; ORMEROD (638) ; RILEY (721).—Report on *Diaspis pentagona* ; FRANCESCHINI (301) ; *id.*, (300) ; MONTILLOT (599).—Handbook of Australian injurious insects ; FRENCH (302) ; *Phylloxera*, MORITZ (604).—Presidential address ; FLETCHER (282).—President's address to Association of Economic Entomologists ; RILEY (720).

For a great variety of notes on injurious insects, and other topics of Economic Entomology, see Ins. Life, iii & iv.—Various brief notes on insects of economic importance in Australia, by OLLIFF, in Agric. Gaz. N.S.W. i & ii, under headings "Entomological Notes," "Insect Pests," &c.

Beetles imported with drugs ; WIMMEL, Verh. Ver. Hamb. vii, pp. 15 & 16.

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N. America ; RILEY (722).—Destructive locusts in N. America ; BRUNER (105).—Report on the Boll worm ; MALLY (559).—*Lepidoptera* injurious to apple ; MURTFELDT, Bull. Dep. Agric. Ent. No. 7, pp. 51–54.—*Diatraea saccharalis*, paper on ; HOWARD, Ins. Life, iv, pp. 95–103.—*Macroductylus subspinosus* ; SMITH (826).—Insect enemies of *Robinia pseudacacia* ; SCHWARZ, P. E. Soc. Wash. ii, pp. 73–76.—Wireworms in N. America ; COMSTOCK & SLINGERLAND (154).—Lepidopterous herbarium pest ; RILEY (724).—Destroying *Lachnosterna* ; RILEY, P. E. Soc. Wash. ii, pp. 58–61.—Importations of *Vedalia* ; RILEY & HOWARD, Ins. Life, iii, p. 440.—Importation of Hessian-fly parasite to N. America ; FORBES (289).—Destruction of mosquitoes and dragon-flies ; LAMBORN, West Am. Sci. vi, pp. 107–109, and (510) ; AARON, WEEKS, BEUTENMULLER (1).—Indian notes ; COTES (162).—Hymenopterous parasites of injurious Indian insects ; CAMERON (129).—E. Indian locusts ; COTES (165, 166).—Enemies of *Acridium peregrinum* in India ; J. Bomb. N. H. Soc. vi, p. 416.—*Schizoneura lanigera* in India ; ATKINSON, Ind. Mus. Notes, ii, p. 52.—The wild silk insects of India ; COTES (163).—Indian white wax ; COTES (164).—A Lepidopterous Sal pest ; DUDGEON (217).—Australian vine pest ; BERGROTH (55).—*Epilachna*, injurious in Australia ; OLLIFF (633).—Damage to fruit trees by *Orthorrhinus*, OLLIFF (634).—*Pseudochina* injurious to tobacco in Australia ; TRYON (876).—*Aphid* injurious to *Styrax benzoin* in Java ; TSCHIRCH (877).—*Coccid* destroying salt-bush ; OLLIFF (635).—Grass-infesting *Coccid* ; MASKELL (568).—*Calandra oryzae* ; OLLIFF (632).—*Carpocapsa pomonella* in New Zealand ; HUDSON (424).

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NB.—The reference-numbers collected under the headings of the various groups refer to "Titles," and are intended to give, in each case, a complete list of all memoirs containing anything of importance in connection with the group.

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Function of clytra ; BUYSSON (124).

Remarks on the nomenclature of some of the species mentioned by PACKARD in 5th Rep. U. S. Ent. Comm. ; HAMILTON (367).

List of described N. American larvæ ; BEUTENMÜLLER (62).

GANGLBAUER (318) includes *Rhysodidae* in the carnivorous series of families, and proposes for the group the name *Caraboidea*.

## CICINDELIDÆ.

[*Cf.* BATES (34), DOHRN (201, 203), HORN (406, 407, 408), HORN & ROESCHKE (409), LESNE (522), LEWIS (534), SRNKA (836), XAMBEU (971).]

For a large number of synonymical and varietal notes on members of this family, reference must be made to HORN, Deutsche e. Z. 1891, pp. 323-331 & 361.

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√ *Chatostyla*, n. subg., for *Cicindela flexuosa*, Fab., GANGLBAUER, p. 18, Käfer Mitteleur i.

*Cicindela* : a series of synonymical notes on palæarctic forms ; HORN, Deutsche e. Z. 1891, pp. 321 & 322. Notes on the species inhabiting Turkestan, with reference to Wilkins' memoir ; HORN (408). *C. aulica* and *aphrodisia*, distinctive characters ; HORN, p. 332, Deutsche e. Z. 1891. *C. connata* treated as valid species, larva described, pp. 137-142, *sylvicola*, p. 142, *flexuosa*, p. 143, larva described ; XAMBEU, Ann. Soc. L. Lyon, xxxviii. *C. (Rhytidophæna) limbata*, Wied., ♂ and systematic characters noticed ; BATES, Ent. xxiv, Supp., p. 7.

*C. aino*, Japan, LEWIS, Ent. M. M. (2) ii, p. 20 ; *C. imperatrix*, E. Africa, SRNKA, Deutsche e. Z. 1891, p. 13 : n. spp.

*Chiloxia longipennis*, Ecuador, HORN, p. 362, Deutsche e. Z. 1891, n. sp.

*Collyris similis*, Laos, LESNE, p. lv, Bull. Soc. Ent. Fr. 1891 ; *C. robusta*, Borneo, DOHRN, p. 252, S. E. Z. 1891 : n. spp.

*Dromica bertinae*, Transvaal, DOHRN, p. 384, S. E. Z. 1891, n. sp.

*Euryomorpha*, notes on ; *E. mouffleti*, Fairm., = (*bohemani*, Boh.) ; KRAATZ, p. 256, Deutsche e. Z. 1891.

## CARABIDÆ.

[*Cf.* BATES (34, 35, 36, 37, 38, 39, 963), BAUDI (43), BLACKBURN (73, 74), DOHRN (201), DUVIVIER (221), FAIRMAIRE (254, 259, 261), GANGLBAUER (314, 317, 318), HAUSEN (376, 377, 378), HORN (404), JAKOWLEFF (437), KOLBE (479), PADEWIETH (644), PETRI (649), QUEDENFELDT (670), REITTER (694, 700, 701), RIESEN (717), ROST (750, 751, 752), SEMENOW (797), TSCHITSCHÉRINE (878, 879, 880, 881), VERHOEFF (900), XAMBEU (971).]

*Abacopercus*, n. subg. of *Abax*, for *A. schüppeli*, Pall.; GANGLBAUER, p. 299, Käfer Mitteleur.

*Acarabus*, n. subg. of *Carabus*, for *C. (A.) grombcewskii*, n. sp., Turkestan; SEMENOW, p. 265, Hor. Ent. Ross. xxv.

*Acupalpus marginicollis*, Syr-Darja, REITTER, p. 221, Wien. ent. Z. x, n. sp.

*Agonum*, crepitation of; LEYDIG, Biol. Centralbl. x, p. 395.

*Agra pacifica*, p. 274, *cyanippe*, p. 275, Mexico, BATES, Tr. E. Soc. 1891, n. spp.

*Agrophoderus*, n. subg. of *Pterostichus*, p. 12, for the n. spp. from Ecuador, *infra* sub *Pterostichus*.

*Amara convexior, continua*, and allies, nomenclature and characters discussed; BORRE, pp. cccciiv-ccccvii, C.R. Ent. Belg. xxxv.

*A. croatica*, S.E. Europe, GANGLBAUER, p. 325, Käfer Mitteleur, n. sp.

*Amblytelus inornatus*, Victoria, p. 781, *discoidalis*, S. Australia, p. 782, BLACKBURN, P. Linn. Soc. N.S.W. (2) v, n. spp.

*Anatrichis oblonga*, Texas, HORN, p. 37, Tr. Am. Ent. Soc. xviii, n. sp.

*Anchomenus melanocephalus*, Dej., note on; HEYDEN, p. 82, Rev. d'Ent. x. *A. 6-punctatus*, n. var. *bruggemanni*; VERHOEFF, Ent. Nachr. xvii, p. 22.

*A. (Agonum) megillus*, Mexico, BATES, p. 252, Tr. E. Soc. 1891; *A. quitensis*, p. 12, *A. (Agonum) andicola*, p. 13, Ecuador, BATES, in Whymper Supp. App. : n. spp.

*Anchonoderus fulvipennis*, Mexico, BATES, p. 264, Tr. E. Soc. 1891, n. sp.

*Anisotarsus hilariolus*, Mexico, BATES, p. 239, Tr. E. Soc. 1891;

*A. bradytoides*, Ecuador, BATES, in Whymper Supp. App. p. 8 : n. spp.

*Anophthalmus ganglbaueri*, Dalmatia, PADEWIETH, p. 258, Wien. ent. Z. x, n. sp.

*Anoplogenus nagpurensis*, E. India, BATES, p. cccxxxiii, C.R. Ent. Belg. xxxv, n. sp.

*Antisphodrus marginipennis*, China, FAIRMAIRE, p. clxxxix, C.R. Ent. Belg. xxxv, n. sp.

*Apenes hilariola*, pl. xiv, fig. 11, *amplicollis*, fig. 12, Mexico, BATES, p. 271, Tr. E. Soc. 1891, n. spp.

*Aphaonus compressus*, Tscherkessia, ROST, p. 313, Deutsche e. Z. 1891, n. sp.

*Bembidium bipunctatum*, larva described; XAMBEU, p. 156, Ann. Soc. L. Lyon, xxxviii.



*B. fauveli*, S. Europe, p. 165, *steinbuhleri*, p. 166, GANGLBAUER, Käfer Mitteleur ; *B. (Trepanes) irroratum*, Syr-Darja, REITTER, p. 221, Wien. ent. Z. x ; *B. victoriense*, p. 785, *secalioides*, p. 786, Victoria, BLACKBURN, P. Linn. Soc. N.S.W. (2) v ; *B. sphærulifer*, p. 261, *B. (Peryphus) macrogonum*, p. 262, *ciudadense*, *B. durangoense*, p. 263, Mexico, BATES, Tr. E. Soc. 1891 ; *B. fulvotinctum*, p. 22, *B. (Peryphus) chimborazonum*, *B. (Notaphus) cayambense*, p. 23, Ecuador, BATES, in Whympers Supp. App. : n. spp.

*Brachinus exhalans* and allies, synonymy discussed ; n. var. *florii* described ; CORRADO, Bull. Ent. Ital. xxiii, pp. 92-97. *B. cognatus* n. var. *cancellatus* ; BATES, p. 269, Tr. E. Soc. 1891.

*B. amplipennis*, *tabasconus*, Mexico, BATES, p. 268, Tr. E. Soc. 1891, n. spp.

*Bradycellus flohri* n. var. *denigratus* ; BATES, p. 247, Tr. E. Soc. 1891.

† *Bronislavia*, n. g., *Ditomides*, p. 280, for *B. robusta*, n. sp., S. Turkestan, p. 285 ; SEMENOW, Hor. Ent. Ross. xxv.

*Brosicus angustulus*, Chinese Turkestan, *batesi*, Assam, SEMENOW, p. 276, Hor. Ent. Ross. xxv, n. spp.

*Calathus* : discussion of winged and wingless forms of ; *C. erratus* and *ambiguus*, hybridity in ; VERHOEFF, pp. 321-325, Ent. Nachr. xvii. *C. glabricollis*, Dej., = (*zealandicus*, Redt.), and the latter was not from New Zealand ; GANGLBAUER, p. 242, Käfer Mitteleur.

*C. bosnicus*, East Europe, GANGLBAUER, p. 243, Käfer Mitteleur ; *C. himalayæ*, India, BATES, Ent. xxiv, Supp. p. 9 ; *C. ambigans*, Mexico, BATES, p. 251, Tr. E. Soc. 1891 : n. spp.

*Calleida chlorotania*, Mexico, BATES, p. 273, pl. xiv, fig. 1, Tr. E. Soc. 1891, n. sp.

*Calosoma azoricum*, characters and synonymy discussed ; ALLUAUD, Mém. Soc. Zool. iv, p. 199. *C. sycophanta* n. var. *purpuripennis* ; REITTER, p. 257, Wien. ent. Z. x. *C. læve*, Dej., variation described, p. 225, *atrovirens*, p. 226, and *striatulum*, p. 228, noticed ; BATES, Tr. E. Soc. 1891.

*C. ampliator*, p. 223, *omiltemium*, p. 226, pl. xiii, fig. 1, *diminutum*, p. 227, fig. 2, *morelianum*, p. 228, *porosifrons*, p. 229, pl. xiii, fig. 3, Mexico, BATES, Tr. E. Soc. 1891, n. spp.

*Carabus* : the synonymy and variation of the species found in Central Europe treated at length ; GANGLBAUER (318). *C. rutilans*, p. 146, *melancholicus*, p. 149, larvae described ; XAMBEU, Ann. Soc. L. Lyon, xxxviii. *C. rossii* n. var. *stoeklini* ; Bull. Ent. Ital. xxiii, p. 100.

*C. pedemontanus*, Maritime Alps, GANGLBAUER, p. 80, Käfer Mitteleur ; *C. trachynodes*, *promachus*, Ta-tsien-lu, BATES, Ent. xxiv, Supp. p. 69 ; *C. (Plectes) kratkyi*, Caucasus, GANGLBAUER, p. 428, Hor. Ent. Ross. xxv ; (see also *Acarabus*) : n. spp.

† *Carterophonus*, n. subg. of *Ophonus* ; GANGLBAUER, p. 341, Käfer Mitteleur.

*Casnonia sulcicollis*, pl. xiv, fig. 8, *lioptera*, Mexico, BATES, p. 265, Tr. E. Soc. 1891, n. spp.

† *Castelnaudia*, n. subg. of *Feronia*, for *F. (Omalosoma) nitidicollis*, Cast.,

for which the new trivial name of *basisulcata* is proposed; TSCHITSCHÉRINE, p. 166, Hor. Ent. Ross. xxv.

*Calascolus severini*, E. India, BATES, p. cccxxxix, C.R. Ent. Belg. xxxv, n. sp.

*Celia californica* var. = (*mexicana*), p. 247, *haegi* n. var. *civilatis*, *tenebrionella* n. var. *aneicolor*, p. 248; BATES, Tr. E. Soc. 1891.

↓ *Celia ciudadensis*, Mexico, BATES, p. 248, Tr. E. Soc. 1891, n. sp.

↓ *Cephalophonus*, n. subg. of *Ophonus*; GANGLBAUER, p. 340, Käfer Mitteleur.

*Ceroglossus buqueti*, n. var. *lepidus*; KRAATZ-KOSCHLAU, S. E. Z. 1891, p. 11.

*Chlenius chrysopleurus*, n. var. *guerreroensis*; BATES, p. 235, Tr. E. Soc. 1891.

*C. testaceicrus*, E. Africa, FAIRMAIRE, p. clxxxix, C.R. Ent. Belg. xxxv; *C. (Homalolachnus) flavoscriptus*, E. Africa, QUEDENFELDT, p. 167, B. E. Z. xxxvi; *C. kuluensis*, India, BATES, Ent. xxiv, Supp., p. 9; *C. rayotus*, E. India, BATES, p. cccxxvii, C.R. Ent. Belg. xxxv; *C. cordifer*, p. 235, *porphyrius*, pl. xiii, fig. 7, *eurybates*, fig. 8, p. 236, *beatus*, fig. 9, *amplians*, *suppletor*, p. 237, Mexico, BATES, Tr. E. Soc. 1891: n. spp.

*Colpodes*: thoracic setæ of some Mexican species noticed; BATES, p. 258, Tr. E. Soc. 1891.

*C. giganteus*, *ambiguus*, p. clxxxvii, *ceruleatus*, p. clxxxviii, China, FAIRMAIRE, C.R. Ent. Belg. xxxv; *C. nivium*, p. 71, *pratti*, p. 72, Ta-tsien-lu, BATES, Ent. xxiv, Supp.; *C. haptoderoides*, p. 252, pl. xiii, fig. 11, *harpaloides*, fig. 12, p. 253, *steropoides*, pl. xiv, fig. 1, *platysmoides*, fig. 2, p. 254, *omaseoides*, fig. 3, *valens*, fig. 4, p. 255, *stenos*, p. 256, *tinctipennis*, *rectilineus*, fig. 5, p. 257, *segregatus*, fig. 6, p. 258, *trujilloi*, *aneicauda*, fig. 6, *acutulus*, fig. 7, p. 259, Mexico, BATES, Tr. E. Soc. 1891; *C. megacephalus*, p. 13, *capito*, *pustulosus*, p. 14, *rotundiceps*, *pichinchæ*, p. 15, *altarensis*, p. 16, *denigratus*, *fusipalpis*, p. 17, *patroboïdes*, *oreas*, p. 18, *lævilateris*, p. 19, *diopsis*, *steno*, *hebeculus*, p. 20, *drusillus*, *alticola*, p. 21, Ecuador, BATES, in WHYMPER Supp. App.: n. spp.

↓ *Cophosomorpha*, n. subg. of *Feronia*, p. 154, for *F. soror*, *anceyi*, p. 156, *capicola*, p. 157, *dichroa*, p. 158, S. Africa, n. spp., and including *F. lulandei*, Br., TSCHITSCHÉRINE, Hor. Ent. Ross. xxv.

*Coptodera xanthopleura*, Mexico, BATES, p. 270, Tr. E. Soc. 1891, n. sp.

*Coscinia transcaspica*, Tedshen, SEMENOW, p. 287, Hor. Ent. Ross. xxv, n. sp.

*Craspedophorus milzi*, Congo, DUVIVIER, p. cccclxxvii, C.R. Ent. Belg. xxxv, n. sp.

*Cymindis sibirica*, Irkutsk, JAKOWLEFF, p. 121, Hor. Ent. Ross. xxv; *C. nivicola*, S. Turkestan, p. 289, *hyaloptera*, Chinese Turkestan, p. 290, *transcaspica*, Askhabad, p. 292, *C. (Menas) antonowi*, Transcaspian region, p. 294, SEMENOW, Hor. Ent. Ross. xxv: n. spp.

*Dercylus (Dercylodes) mexicanus*, Tapachula, BATES, p. 238, Tr. E. Soc. 1891, n. sp.

*Diaphoromerus victoriensis*, Australia, BLACKBURN, P. Linn. Soc. N.S.W. (2) v, p. 777, n. sp.

*Dicælus costatus*, n. var. *lerdoensis*, p. 238, *lævipennis*, n. var. *abbreviatus*, p. 239; BATES, Tr. E. Soc. 1891.

*Dichropterus strictus*, Sardinia, BAUDI, Nat. Sicil. x, p. 77, n. sp.

*Dicranoncus pallidicornis*, China, FAIRMAIRE, p. clxxxviii, C.R. Ent. Belg. xxxv, n. sp.

*Dicrochile ventralis*, S. Australia, BLACKBURN, p. 65, Tr. R. Soc. S. Austr. xiv, n. sp.

*Discoderus cordicollis*, p. 34, *crassicollis*, p. 35, N. America, HORN, Tr. Am. Ent. Soc. xviii; *D. dislocatus*, Mexico, BATES, p. 245, Tr. E. Soc. 1891: n. spp.

*Distichus granulipygus*, Mexico, BATES, p. 232, Tr. E. Soc. 1891, n. sp.

*Ditomides*: table of the characters of genera; SEMENOW, pp. 282-285, Hor. Ent. Ross. xxv.

*Dyschirius similis*, Siebenburgen; PETRI, Verh. Siebenb. Ver. xli, p. 12; *D. ovensensis*, Victoria, BLACKBURN, P. Linn. Soc. N.S.W. (2) v, p. 775: n. spp.

*Elliptoleus olisthopoides*, Mexico, BATES, p. 252, Tr. E. Soc. 1891, n. sp.

*Euchroa chrysophana*, Mexico, BATES, p. 249, Tr. E. Soc. 1891, n. sp.

↓ *Eurylychnus*, n. g., *Broscinae*, p. 285, for *E. olliffi*, n. sp., p. 286, N. S. Wales; BATES, Ent. M. M. (2) ii.

↑ *Eurynebria*, n. g., for *Nebria complanata*, auct.; GANGLBAUER, p. 134, Wien. ent. Z. x.

*Feronia*: table of the characters of the Australian subgenera; TSCHITSCHÉRINE, pp. 161-165, Hor. Ent. Ross. xxv. *F. (Adelosia) picimana* = (*anachoreta*, Mén.); TSCHITSCHÉRINE, t. c. p. 148. *F. ventricosa*, Esch., and var. *brevicollis*, note on; *F. riparia*, Dej., = (*fatua*, Mann.), p. 142, *pinguedinea*, Esch., characters noticed; *quadricollis*, *similis*, noticed as distinct, p. 143; TSCHITSCHÉRINE, t. c. *F.*, subg. *Camptoscelis*, characters of; TSCHITSCHÉRINE, p. 153, t. c. Subg. *Pseudopedius*, composition of, and table of characters of species; TSCHITSCHÉRINE, t. c. p. 145 & 146. *F.*: note on the subg. *Pseudoderus* and its composition; TSCHITSCHÉRINE, t. c. p. 143. *F. (Argutor) australis*, Dej., = (*Orthomus antipodus*, Motsch.); TSCHITSCHÉRINE, t. c. p. 165. *F. renardi*, Chd., = (*hercules*, Cast.); TSCHITSCHÉRINE, p. 166, t. c. *F. amaroides*, larva described; XAMBEU, p. 154, Ann. Soc. L. Lyon, xxxviii.

*F. koenigiana*, Caucasus, TSCHITSCHÉRINE, p. 431, Hor. Ent. Ross. xxv; *F. (Abax) undulatorugosa*, Natal, TSCHITSCHÉRINE, p. 152, Hor. Ent. Ross. xxv; *F. (Eucamptognathus) boucardi*, Madagascar, TSCHITSCHÉRINE, t. c. p. 151; *F. (Holcaspis) convexidorsis*, New Zealand, p. 166; *F. (Rhabdotus) chandoiri*, Australia, p. 168, *F. (Rhytisternus) lævidorsis*, Brisbane, p. 169, *F. (Chlanioidius) irideomicans*, Australia, p. 170, TSCHITSCHÉRINE, t. c.; *F. (Pseudocryobius) rugifera*, Ounalaschka, TSCHITSCHÉRINE, p. 141, t. c.; *F. (Pseudopedius) plustschewskyi*, Kirghiz Steppes, p. 147, *F. (Ancholeus) prasinipennis*, *F. (Adelosia) funeraria*, Turkestan, p. 148, TSCHITSCHÉRINE, t. c.; *F. (Pseudoderus) grom-*

*bezewskyi*, Alaï, p. 144, *cyanidorsis*, Astrakhan, p. 145, TSCHITSCHÉRINE, *t. c.*; (see also *Castelnaudia* and *Cophosomorpha*) : n. spp.

*Galerita ovalipennis*, Mexico, BATES, p. 266, pl. xiv, fig. 9, Tr. E. Soc. 1891, n. sp.

*Gigadema grandis*, characters of; BATES, Ent. M. M. (2) ii, p. 286.

*Harpalophonus*, n. subg. of *Ophonus*; GANGLBAUER, p. 341, Käfer Mitteleur.

*Harpalus ebeninus*, Heyd., = (*cardioderus*, Putz.); BEDEL, p. 153, L'Ab. xxvii.

*H. abasinus*, Caucasus, ROST, p. 314, Deutsche e. Z. 1891; *H. amarellus*, India, BATES, Ent. xxiv, Supp. p. 10; *H. oreas*, Ta-tsien-lu, BATES, *t. c.* p. 72; *H. indicus* (Chaud.), *praticola* (Chaud.), E. India, BATES, p. cccxxxii, C.R. Ent. Belg. xxxv; *H. durangoensis*, Mexico, BATES, p. 240, Tr. E. Soc. 1891 : n. spp.

*Hypercosmeton quadrimaculatum*, New Margelan, REITTER, p. 234, Wien. ent. Z. x; *H. jakowlewi*, Transcaspian region, SEMENOW, p. 296, Hor. Ent. Ross. xxv : n. spp.

*Hypharpax vilis*, S. Australia, BLACKBURN, P. Linn. Soc. N.S.W. (2) v, p. 777; *H. sloanei*, N. S. Wales, BLACKBURN, p. 65, Tr. R. Soc. S. Austr. xiv : n. spp.

*Hypolithus acutangulus* (Chaud.), E. India, BATES, p. cccxxxi, C.R. Ent. Belg. xxxv, n. sp.

*Inna planipennis*, Mexico, BATES, p. 267, pl. xiv, fig. 10, Tr. E. Soc. 1891, n. sp.

*Lachnophorus cuprellus*, Mexico, BATES, p. 264, Tr. E. Soc. 1891, n. sp.

*Laemosthenes* (*Pristonychus*) *turkestanicus*, S. Turkestan, *amasie*, Asia Minor, p. 271, *L. (Antisphodrus) conradli*, S. Turkestan, p. 273, SEMENOW Hor. Ent. Ross. xxv, n. spp.

*Lasiotrechus*, n. subg. of *Trechus*, for *T. discus*, auct., GANGLBAUER, p. 191, Käfer Mitteleur.

*Lebia smithiella*, Mexico, BATES, p. 273, Tr. E. Soc. 1891, n. sp.

*Lecanomerus nitidus*, Victoria, BLACKBURN, p. 779, P. Linn. Soc. N.S.W. (2) v, n. sp.

*Leiocnemis chalciope*, Ta-tsien-lu, BATES, Ent. xxiv, Supp. p. 71, n. sp.

*Leptromorpha*, n. subg. of *Amara*; GANGLBAUER, p. 313, Käfer Mitteleur.

*Leironotus*, n. subg. of *Amara*, GANGLBAUER, p. 314, Käfer Mitteleur.

*Leistus apfelbecki*, Herzegovina, GANGLBAUER, p. 539, Käfer Mitteleur; *L. elegans*, Caucasus, ROST, p. 126, Deutsche e. Z. 1891 : n. spp.

*Loxandrus rubricatus*, Mexico, BATES, p. 250, Tr. E. Soc. 1891, n. sp.

*Loxopeza calomicra*, Mexico, BATES, p. 273, Tr. E. Soc. 1891, n. sp.

*Nastax leviceps*, E. India, BATES, p. cccxxxvii, C.R. Ent. Belg. xxxv, n. sp.

*Molops vlasuljensis*, *curtulus*, p. 304, *apfelbecki*, p. 305, Central Europe, GANGLBAUER, Käfer Mitteleur, n. spp.

*Nebria lafrešnayeï*, larva described; XAMBEU, p. 151, Ann. Soc. L. Lyon, xxxviii. *N. limbigera*, Solsky, n. var. *picta*; SEMENOW, p. 266, Hor. Ent. Ross. xxv. *N. complanata* : vide *Eurynebria*.

*N. apfelbecki*, Herzegovina, p. 106, *speiseri*, Bosnia, p. 540, GANGLBAUER, Käfer Mitteleur; *N. grombcewskii*, Chinese Turkestan, SEMENOW, p. 266, Hor. Ent. Ross. xxv : n. spp.

*Notiophilus*, characters of the species found in Siebenburgen; PETRI, pp. 23-26, Verh. Siebenb. Ver. xli.

*Notophilus montanus*, Victoria, BLACKBURN, p. 780, P. Linn. Soc. N.S.W. (2) v, n. sp.

*Oodes mauritanicus*, Luc., validity of, with characters; BÉDEL, p. 153, L'Ab. xxvii.

*Orthogonius collaris*, Borneo, DOHRN, S. E. Z. 1891, p. 253; *O. lucidus*, E. India, BATES, p. cccxxxvii, C.R. Ent. Belg. xxxv : n. spp.

*Orthotrichus indicus*, Konbir, BATES, p. cccxxxiv, C.R. Ent. Belg. xxxv, n. sp.

*Oxylobus punctatosulcatus* n. var. *meridionalis*; BATES, C.R. Ent. Belg. xxxv, p. cccxxxv.

*Panagæus crucigerus*, Say, oviposition; HAMILTON, p. 181, Canad. Ent. xxiii.

*P. sumatranus*, Sumatra, DOHRN, p. 253, S. E. Z. 1891, n. sp.

† *Parophonus*, n. subg. of *Ophonus*; GANGLBAUER, p. 340, Käfer Mitteleur.

*Pasimachus mexicanus* n. var. *cæruleus*; BATES, p. 231, Tr. E. Soc. 1891.

*P. ignicinctus*, p. 230, *Jævisulcatus*, p. 231, *smithii*, p. 232, pl. xiii, fig. 6, Mexico, BATES, Tr. E. Soc. 1891, n. spp.

*Oodes mexicanus*, Chev., = (*texanus*, Lec.); HORN, p. 37, Tr. Am. Ent. Soc. xviii.

*Ophonus puncticollis* and allies, synonymy noticed; SHARP, p. xix, P. E. Soc. 1891.

*Patrobis davidis*, China, FAIRMAIRE, p. clxxxix; C.R. Ent. Belg. xxxv, n. sp.

*Pelmatellus variipes*, p. 8, *orynodes*, *andium*, *gauchalensis*, p. 9, Ecuador, BATES, in Whympers Supp. App., n. spp.

*Penetretus quadraticollis*, W. China, BATES, Ent. xxiv, p. 70, n. sp.

*Percosoma blagravii*, Cast., systematic characters; BATES, Ent. M. M. (2) ii, p. 286.

*Pericompso tabasconus*, Mexico, BATES, p. 261, Tr. E. Soc. 1891, n. sp.

*Pinacodera atrata*, n. var. *ruficornis*; BATES, p. 270, Tr. E. Soc. 1891.

† *Plataphodes*, n. subg. of *Bembidium*, for *B. fellmanni*, Mann.; GANGLBAUER, p. 152, Käfer Mitteleur.

*Platymetopus nagpurensis*, p. cccxxix, *P. (P.) sublaevis*, *major*, p. cccxxx, E. India, BATES, C.R. Ent. Belg. xxxv, n. spp.

*Platynus willbergi*, Taschkent, REITTER, p. 233, Wien. ent. Z. x; *P. (Anchomenus) testaceo-notus*, Hausen, p. 162, Nat. Canad. xx : n. spp.

*Plectes obtusus* = (*starckianus* and *imperator*); ROST, p. 346, Deutsche e. Z. 1891. *P. plasoni*, Ganglb., note on; ROST, p. 314, Deutsche e. Z. 1891. *P. reitteri*, n. var. *fallax*; *id. t. c.* p. 315.

† *Peciloidia*, n. subg. of *Feronia*, for *T. iridescens*, Cast.; TSCHITSCHÉRINE, p. 171, Hor. Ent. Ross. xxv.

*Pæcilus junthinipennis*, Solsky, characters noticed ; REITTER, p. 58, Wien. ent. Z. x.

*P. turkestanicus*, Taschkent, REITTER, p. 35, Deutsche e. Z. 1891, n. sp.

↓ *Pogonidium*, n. subg. of *Bembidium*, for *B. laticolle*, Duftsch. ; GANGLBAUER, p. 151, Käfer Mitteleur.

*Pogonus peisonis*, Hungary, GANGLBAUER, p. 223, Käfer Mitteleur ; *P. (Diplochætus) emaciatus*, Mexico, BATES, p. 260, Tr. E. Soc. 1891 : n. spp.

*Polyhirma proluxa*, E. Africa, FAIRMAIRE, p. cclxxxi, C.R. Ent. Belg. xxxv, n. sp.

*Pristodactyla allicola*, Ta-tsien-lu, BATES, Ent. xxiv, Supp. p. 71, n. sp.

*Psammozenus*, Chaud, is to be merged in *Cymindis* ; SEMENOW, p. 294, Hor. Ent. Ross. xxv.

↓ *Pseudoceneus*, n. subg. of *Feronia*, for *holomelana*, TSCHITSCHÉRINE, p. 171, Hor. Ent. Ross. xxv.

*Pseudopedius bæticus*, Ramb., is a valid species, of which *planidorsis*, Reit., is synonym ; REITTER, p. 226, Wien. ent. Z. x.

↓ *Pseudorites*, n. subg. of *Pterostichus*, for *P. nicænsis*, auct. ; GANGLBAUER, p. 264, Käfer Mitteleur.

*Pterostichus pedemontanus*, Western Alps, p. 284, *bertarinii*, p. 290, GANGLBAUER, Käfer Mitteleur ; *P. (Pseudoderus) tschitscherini*, S. Turkestan, SEMENOW, p. 275, Hor. Ent. Ross. xxv ; *P. (Hypherpes) inanis, caligans*, p. 32, *P. blanchardi*, p. 33, N. America, HORN, Tr. Am. Ent. Soc. xviii ; *P. (Dysidius) stenopus*, Canada, HAUSEN, Canad. Rec. iv, p. 253, pl. ii, fig. 2 ; *P. (Dysidius) pulvinatus*, Montreal, HAUSEN, p. 159, Nat. Canad. xx ; *P. (Agraphoderus) antisanae, pichineæ*, p. 10, *liodes, intiger*, p. 11, BATES, in Whymper Supp. App. : n. spp.

*Reicheia* : table of characters of the species ; BAUDI, Nat. Sicil. x, pp. 73-77 & 167.

↓ *Reicheiodes*, n. subg. of *Dyschirius*, GANGLBAUER, p. 139, Käfer Mitteleur.

*Rhembus transcaspicus*, Tedshen, SEMENOW, p. 278, Hor. Ent. Ross. xxv ; *R. rectificatus*, E. India, BATES, p. ccxxix, C.R. Ent. Belg. xxxv : n. spp.

*Rhysotrachelus teani* redescribed ; KOLBE, p. 20, S. E. Z. 1891.

*Scaphinotus macrogonus*, Mexico, BATES, p. 229, pl. xiii, fig. 5, Tr. E. Soc. 1891, n. sp.

*Scarites durangoensis*, Mexico, BATES, p. 232, pl. xiii, fig. 4, Tr. E. Soc. 1891, n. sp.

*Scythoprasus nicaraguensis*, Chontales, BATES, p. 234, Tr. E. Soc. 1891, n. sp.

*Schizogenius multisetosus*, Mexico, BATES, p. 233, Tr. E. Soc. 1891, n. sp.

*Selenophorus tarsalis*, n. var. *liosomus*, p. 242, *crassiusculus*, n. var. *nigrescens*, p. 244, *arcuatus*, Putz., generic characters noticed, p. 245 ; BATES, Tr. E. Soc. 1892.

*S. aureocupreus*, p. 241, *bradycelloides*, p. 242, *dispar*, p. 243, Mexico, BATES, Tr. E. Soc. 1891, n. spp.

*Stenocrepis*, *Stenous*, and *Crossocrepis*, validity of discussed ; HORN, pp. 37 & 38, Tr. Am. Ent. Soc. xviii.

*Stenolophus lamprotus*, Mexico, BATES, p. 246, Tr. E. Soc. 1891, n. sp.

†*Steropomorpha*, n. subg. of *Feronia*, for *Steropus lenis*, Germ. ; TSCHITSCHÉRINE, p. 159, Hor. Ent. Ross. xxv.

*Synuchus simplex*, West Turkestan, SEMENOW, p. 267, Hor. Ent. Ross. xxv, n. sp.

*Tachys incurvus*, habits ; ULKE, P. E. Soc. Wash. ii, p. 87.

*T. (Barytachys) feanus*, E. India, BATES, p. cccxxvi, C.R. Ent. Belg. xxxv ; *T. baldiensis*, p. 782, *ovensensis*, p. 781, *brightensis*, p. 785, Victoria, BLACKBURN, P. Linn. Soc. N.S.W. (2) v ; *T. (Barytachys) decastichus*, Mexico, BATES, p. 261, Tr. E. Soc. 1891 : n. spp.

*Taphoxenus subcylindricus*, Transcaspian region, p. 268, *T. (Pseudotaphoxenus) dissors*, Turkestan, p. 269, SEMENOW, Hor. Ent. Ross. xxv, n. spp.

*Tefflus bertherandi*, Africa int., FAIRMAIRE, p. 231, pl. v, fig. 3, Ann. Soc. Ent. Fr. 1891, n. sp.

†*Testediolum*, n. subg. of *Bembidium*, for *B. glaciale* and allies ; GANGLBAUER, p. 170, Käfer Mitteleur.

*Tetragonoderus cardoni*, E. India, BATES, p. cccxxxviii, C.R. Ent. Belg. xxxv, n. sp.

*Thenarotes discoidalis*, n. var. *nigricornis* ; BLACKBURN, p. 780, P. Linn. Soc. N.S.W. (2) v.

*Thyreopterus cordicollis*, Congo, DUVIVIER, p. ccclxxvi, C.R. Ent. Belg. xxxv, n. sp.

†*Trechoblenus*, n. subg. of *Trechus*, for *T. micros*, auct. ; GANGLBAUER, p. 187, Käfer Mitteleur.

*Trechus pinkeri*, E. Europe, GANGLBAUER, p. 197, Käfer Mitteleur ; *T. grandis*, Styria, p. 115, *leontinus*, Alps, *bosnicus*, S. Bosnia, p. 116, *schusteri*, Carinthia, p. 117, *strasseri*, Tessin, p. 118, *ormayi*, Transsylvania, p. 119, *hampei* (= *angustatus*, Hampe), p. 120, *simonyi*, p. 121, *pallidulus*, p. 121, Austria, *rudolphi*, Carinthia, p. 122, *kimakowiczi*, Transsylvania, p. 123, *T. (Anophthalmus) pilifer*, p. 124, *trescavicensis*, p. 125, *reiseri*, p. 126, *T. (Aphænops) apfelbecki*, p. 127, Bosnia, GANGLBAUER, Wien. ent. Z. x : n. spp.

†*Trichocellus*, n. subg. of *Bradycellus*, for *D. cognatus*, auct., &c. ; GANGLBAUER, p. 366, Käfer Mitteleur.

†*Xenodromius*, n. g. near *Axinopalpus*, for *X. flohri*, n. sp., Mexico, pl. xiv, fig. 13 ; BATES, p. 272, Tr. E. Soc. 1891.

*Zuphium punctipenne*, Mexico, BATES, p. 266, Tr. E. Soc. 1891, n. sp.

## DYTISCIDÆ.

[Cf. ALLUAUD (10), HELLIESEN (382), LEYDIG (540), RASPAIL (682), REEKER (688), SHARP (805, 806), XANBEU (971).]

Stridulating apparatus of *Dytiscidæ* ; REEKER (688).

*Dytiscus latissimus*, &c. : origin of the substance found at the extremity of the abdomen of some ♀s of ; LEYDIG (540).

*Agabus discolor*, Har., and *phaeopterus*, Kirb., are one species, its synonymy; HAMILTON, Canad. Ent. pp. 185 & 186. *A. bipustulatus*, p. 159, *chalconotus*, p. 163, larvæ described; XAMBEU, Ann. Soc. L. Lyon, xxxviii.

*Agabus dichrous*, Pamir, SHARP, p. 38, *Col. Sec. Yark. Miss.*, n. sp.

*Deronectes murilinus*, Norway, HELLIESEN, Stavanger Mus. 1890, p. 20, pl. fig. 4, n. sp.

*Hydroporus griseo-striatus*, larva described; XAMBEU, p. 166, Ann. Soc. L. Lyon, xxxviii.

*H. munsterii*, p. 22, pl. fig. 5, *montanus*, p. 23, fig. 7, Norway, HELLIESEN, Stavanger Mus. 1890; *H. guernei*, Azores, RÉGIMBART, Mem. Soc. Zool. iv, p. 202 : n. spp.

*Hyphydrus aubei*, n. n. for *variegatus*, Aubé; GANGLBAUER, p. 448, Käfer Mitteleur.

*Ilybius cinctus*, Yangihissar, SHARP, p. 38, *Col. Sec. Yark. Miss.*, n. sp.

*Rhantus yessoensis*, Japan, SHARP, Ent. xxiv, Supp. p. 6, n. sp.

### GYRINIDÆ.

[Cf. RÉGIMBART (689, 690).]

RÉGIMBART has published, Ann. Soc. Ent. Fr. 1891, a second supplement to his monograph; it contains a large number of critical and synonymical remarks that it is unnecessary to record in detail here; only the n. spp. are given below.

*Aulonogyrrus alternatus*, S. Africa, RÉGIMBART, p. 672, Ann. Soc. Ent. Fr. 1891, n. sp.

*Gyretes pipitzi*, Rio Grande do Sul, *quadrispinosus*, Amazons, p. 685, *lojensis*, Ecuador, p. 686, *inflatus*, Brazil, p. 687, RÉGIMBART, Ann. Soc. Ent. Fr. 1891, n. spp.

*Gyrinus natalensis*, S. Africa, p. 674, *atlanticus*, Azores, p. 678, *superciliaris*, Madagascar, p. 681, *smaragdinus*, Burma, p. 682, RÉGIMBART, Ann. Soc. Ent. Fr. 1891, n. spp.

*Orectochilus incrassatus*, Celebes, p. 690, *landaisi*, Tonkin, p. 691, *sublineatus*, Assam, p. 695, *figuratus*, Padong, p. 698, *chinensis*, Chang-Yang, p. 699, *severini*, China, p. 700, *tonkinensis*, Cao-Bang, p. 701, *cuneatus*, Sikkim, p. 702, *florensis*, Flores, *nigricans*, Celebes, p. 703, *sulcipennis*, Tonkin, p. 705, *hemorrhous*, E. India, *fusiformis*, China, p. 706, *castelsi*, Madras, *murinus*, Sikkim, p. 709, *undulans*, Tonkin, p. 711, *obtusipennis*, Shanghai, p. 712, *cylindricus*, p. 713, *cardoni*, p. 714, Bengal, RÉGIMBART, Ann. Soc. Ent. Fr. 1891, n. spp.

*Orectogyrrus sexualis*, p. 191, *angularis*, p. 192, *demeryi*, p. 193, *discors*, p. 194, Liberia, RÉGIMBART, Notes Leyd. Mus. xiii; *O. grandis*, Congo, p. 715, *zanzibaricus*, E. Africa, p. 716, *vestitus*, p. 717, *hastatus*, Madagascar, p. 720, *gymnonotus*, Transvaal, p. 721, *prolongatus*, Senegal, p. 722, *vicinus*, Madagascar, p. 724, *sexualis*, p. 726, *conjungens*, p. 727, *angularis*, p. 729, *jucundus*, p. 730, *demeryi*, p. 731, *elevatus*, p. 732, *discors*, p. 734, *moquerysi*, *pictimanus*, p. 735, W. Africa, *purpureus*, Madagascar, p. 736, RÉGIMBART, Ann. Soc. Ent. Fr. 1891 : n. spp.



*Porrhorrhynchus landaisi*, Tonkin, RÉGIMBART, p. 667, Ann. Soc. Ent. Fr. 1891, n. sp.

## HYDROPHILIDÆ.

[*Cf.* BLACKBURN (74), HELLISEN (382), KUWERT (507, 508, 509).]

*Hydræna laticollis*, Greece, KUWERT, p. 363, Deutsche e. Z. 1891, n. sp.

*Hydrobius fuscipes*, *picicrus*, *rottenbergi*, distinctive characters of ; HELLISEN, Stavanger Mus. 1890, pp. 27 & 28, pl., figs. 8-10.

*Hydrophilus piceus*, metamorphoses ; PLANET, Le Nat. 1891, p. 259, woodcuts.

*Laccobius montanus*, *australis*, Victoria, BLACKBURN, p. 67, Tr. R. Soc. S. Austr. xiv, n. spp.

*Paracymus nigerrimus*, Victoria, BLACKBURN, p. 66, Tr. R. Soc. S. Austr. xiv.

*Philydrus carbonarius*, Dresden, KUWERT, p. 364, Deutsche e. Z. 1891, n. sp.

*Sternolophus noticollis* and *solieri*, distinctive characters ; KUWERT, p. 311, Deutsche e. Z. 1891.

*Trymochthebius taygetanus*, Greece, KUWERT, p. 363, Deutsche e. Z. 1891, n. sp.

## PLATYPSYLLIDÆ.

*Platypsyllus*, notes on the larva of ; RILEY, P. E. Soc. Wash. ii, p. 27.

## STAPHYLINIDÆ.

[*Cf.* BLACKBURN (73, 74), EPPELSHEIM (246, 247), FAIRMAIRE (259, 261), FAUVEL (273, 274), HAUSEN (378), MELLMANN (576), PETRI (649), REITTER (694, 697, 698, 706), SHARP (806, 963), VARENIUS (890), WASMANN (932, 934), XAMBEU (971).]

*Agerodes simoni*, Venezuela, FAUVEL, p. 105, Rev. d'Ent. x, n. sp.

*Astenius parviceps*, Sicily, RAGUSA, Nat. Sicil. x, p. 239, n. sp.

*Atheta carpathica* and *alpicola*, Mill., are good species, their distinctions given ; REITTER, p. 257, Wien. ent. Z. x.

*Baptolinus affinis*, larva described ; XAMBEU, p. 173, Ann. Soc. L. Lyon, xxxviii.

*Belomuchus amplipennis*, *breviceps*, p. 117, *modestus*, p. 118, Venezuela, FAUVEL, Rev. d'Ent. x, n. spp.

*Bledius insignicornis*, p. 75, *ovensensis*, *infans*, p. 76, Victoria, BLACKBURN, Tr. R. Soc. S. Austr. xiv, n. spp.

*Calocerus*, n. g., for *Glyptoma*, Er. ; FAUVEL, p. 88, Rev. d'Ent. x.

*Cryptobium cingulatum*, p. 103, *densipenne*, p. 104, Venezuela, FAUVEL, Rev. d'Ent. x, n. spp.

*Diachus maculicollis*, Venezuela, FAUVEL, p. 106, Rev. d'Ent. x, n. sp.

*Doliceon korbi*, Andalusia, EPPELSHEIM, p. 225, Wien. ent. Z. x ; *D. rubripennis*, Turcomania, REITTER, p. 138, Wien. ent. Z. x : n. spp.

*Domene* ? *torrensensis*, S. Australia, BLACKBURN, p. 75, Tr. R. Soc. S. Austr. xiv, n. sp.

*Eleusis indica*, Kr., = (*fasciata*, Lec.) ; FAUVEL, p. 88, Rev. d'Ent. x.

*Falagria collaris*, Sea of Aral, REITTER, p. 17, Deutsche e. Z. 1891, n. sp.

*Gastrisus cribrum*, Venezuela, FAUVEL, p. 107, Rev. d'Ent. x, n. sp.

*Geodromicus cordicollis*, Siebenburgen, PETRI, p. 18, Verh. Siebenb. Ver. xli, n. sp.

*Glyptoma*, see *Calocerus*.

*Gnathymenus rufoniger*, Venezuela, FAUVEL, p. 100, Rev. d'Ent. x, n. sp.

↓ *Hasumius*, n. g., near *Creophilus*, for *H. validus*, n. sp., E. Africa ; FAIRMAIRE, C.R. Ent. Belg. xxxv, p. cclxxii.

*Heterothops taurus*, Bk., referred to *Quedius* ; BLACKBURN, p. 69, Tr. R. Soc. S. Austr. xiv.

*H. tanygnathoides*, *laticolor*, p. 17, *angusticeps*, *willbergi*, p. 18, Sea of Aral, REITTER, Deutsche e. Z. 1891 ; *H. towarensis*, Venezuela, FAUVEL, p. 120, Rev. d'Ent. x : n. spp.

*Hyperomma lacertinum*, sexual distinctions ; BLACKBURN, p. 70, Tr. R. Soc. S. Austr. xiv.

*Kraatzia*, note on its validity and author ; KRAATZ, p. 133, Deutsche e. Z. 1891.

*Lathrinæum reflexum*, Taschkent, REITTER, p. 195, Wien. ent. Z. x, n. sp.

*Lathrobium victoriense*, Australia, BLACKBURN, p. 71, Tr. R. Soc. S. Austr. xiv, n. sp.

*Leptonia* (sub *Homalota*) *lunata*, Er., = (*picta*, Shp.) ; FAUVEL, p. 123, Rev. d'Ent. x.

*Lispinus linearis*, Er., = (*planus*, Shp.) ; FAUVEL, p. 89, Rev. d'Ent. x.

*Lithocharis* (*Medon*) *nitida*, Siebenburgen, PETRI, p. 14, Verh. Siebenb. Ver. xli ; *L. varicornis*, Victoria, BLACKBURN, p. 72, Tr. R. Soc. S. Austr. xiv : n. spp.

*Maseochara valida*, parasitic habits of larva ; COQUILLET, Ins. Life, iii, p. 318.

*Megacronus fasciatus*, France, FAUVEL, p. 60, Rev. d'Ent. x, n. sp.

*Megalops angulicollis*, Venezuela, FAUVEL, p. 92, Rev. d'Ent. x, n. sp.

*Megarthus thomsoni*, Sweden, VARENIUS, p. 22, Ent. Tidskr. xii, n. sp.

*Merona cinctella*, Motsch., redescribed ; FAUVEL, p. 122, Rev. d'Ent. x.

*Mycetoporus quadrillum*, Pyrenees, FAUVEL, p. 61, Rev. d'Ent. x, n. sp.

*Ocypus aethiops*, larva described ; XAMBEU, p. 171, Ann. Soc. L. Lyon, xxxviii.

*O. plagiicollis*, *fraternus*, China, FAIRMAIRE, p. exci, C.R. Ent. Belg. xxxv, n. sp.

*Ocyusa fauveli*, Sicily, RAGUSA, Nat. Sicil. x, p. 142, n. sp.

*Oligota pilicornis*, France, FAUVEL, p. 62, Rev. d'Ent. x, n. sp.

*Ophtes* ? *africanus*, E. Africa, FAIRMAIRE, p. cclxxxii, C.R. Ent. Belg.

xxxv, n. sp.

*Osorius hirtulus*, Venezuela, FAUVEL, p. 92, Rev. d'Ent. n. sp.

*Othius chrysurus*, Taschkent, REITTER, p. 195, Wien. ent. Z. x, n. sp.  
*Oxytelus insignitus*, Gr., = (*pumilio*, Boh.); FAUVEL, p. 91, Rev. d'Ent. x.  
*O. (Anotylus) bisulcatus*, Siebenburgen, PETRI, p. 16, Verh. Siebenb. Ver. xli; *O. sulcifer*, Venezuela, FAUVEL, p. 90, Rev. d'Ent. x : n. spp.

*Pæderus meyricki*, W. Australia, BLACKBURN, p. 72, Tr. R. Soc. S. Austr. xiv; *P. ornaticornis*, Guayaquil, SHARP, in Whympers Supp. App. p. 42 : n. spp.

*Palaminus plagiatus*, p. 96, *quadriguttatus*, *biguttatus*, *heraldicus*, p. 97, *lancifer*, *rugicollis*, p. 98, Venezuela, FAUVEL, Rev. d'Ent. x, n. spp.

*Philonthus fervidus*, Er., referred to *Eugastus*; FAUVEL, p. 109, Rev. d'Ent. x.

*P. stoliczkae*, Yarkand, p. 40, *pamirensis*, Pamir, p. 41, SHARP, Col. Sec. Yark. Miss.; *P. stictus*, Canada, HAUSEN, p. 321, Canad. Rec. iv; *P. whympersi*, p. 40, *divisus*, p. 41, Ecuador, SHARP, in Whympers Supp. App.; *P. indigaceus*, p. 110, *dispersus*, p. 111, *cribrellus*, p. 112, *prismalis*, *semicupreus*, p. 114, *lucidus*, p. 116, Venezuela, FAUVEL, Rev. d'Ent. x : n. spp.

*Pinophilus armiger*, Venezuela, FAUVEL, p. 99, Rev. d'Ent. x, n. sp.

*Platyprosopus bagdadensis*, Stierl., = (*araxis*, Reitt.); REITTER, p. 256, and EFFELSHEIM, p. 225, Wien. ent. Z. x.

*P. araxis*, Ordubad, REITTER, p. 138, Wien. ent. Z. x, n. sp.

*Platystethus cornutus*, p. 181, *spinosus*, p. 185, larvæ, described; XAMBEU, Ann. Soc. L. Lyon, xxxviii.

*Proteinus atomarius*, n. var. *oblongus*, PETRI, p. 22, Verh. Siebenb. Ver. xli.

*Pseudopsis sulcata*, Newm., = (*columbica*, Fauv.); FAUVEL, p. 89, Rev. d'Ent. x.

*Quedius cuprinus*, Fauv., var. *♀ baldiensis*, described; BLACKBURN, p. 69, Tr. R. Soc. S. Austr. xiv.

*Q. angulicollis*, France, FAUVEL, p. 60, Rev. d'Ent. x; *Q. (Raphirus) haberfelneri*, Austria, EFFELSHEIM, p. 200, Wien. ent. Z. x; *Q. viridipennis*, *triangulum*, Venezuela, FAUVEL, p. 119, Rev. d'Ent. x : n. spp.

*Sciocharis signata*, Venezuela, FAUVEL, p. 102, Rev. d'Ent. x, n. sp.

*Scopæus dubius*, *obscuripennis*, Victoria, BLACKBURN, p. 73, Tr. R. Soc. S. Austr. xiv; *S. rudis*, Venezuela, FAUVEL, p. 103, Rev. d'Ent. x : n. spp.

*Silusa gobanzi*, Villach, REITTER, p. 259, Wien. ent. Z. x, n. sp.

*Sipalia laticornis*, larva described; XAMBEU, p. 169, Ann. Soc. L. Lyon, xxxviii.

*Staphylinus aurosericans*, China, FAIRMAIRE, p. cxc, C.R. Ent. Belg. xxxv, n. sp.

*Stenus australicus*, Victoria, BLACKBURN, P. Linn. Soc. N.S.W. (2) v, p. 788; *S. gutta*, p. 93, *notipennis*, *fenestralis*, p. 94, *subnotatus*, p. 95, Venezuela, FAUVEL, Rev. d'Ent. x : n. spp.

*Sterculia impressipennis*, Ecuador, SHARP in Whympers Supp. App. p. 41, n. sp.

*Styngetus gouldoti*, *sharpi*, Venezuela, FAUVEL, p. 108, Rev. d'Ent. x, n. spp.

*Tachinus stoliczkae*, Pamir, SHARP, p. 40, *Col. Sec. Yark. Miss.*; *T. novitius*, Victoria, BLACKBURN, p. 68, *Tr. R. Soc. S. Austr.* xiv : n. spp.

*Tænodema aureipilis*, Venezuela, FAUVEL, p. 98, *Rev. d'Ent.* x, n. sp.

<sup>4</sup>*Termitobia*, n. g., *Aleocharinorum*, p. 647, for *T. physogastra*, n. sp., in nests of *Termes bellicosus*, W. Africa, p. 649, pl. vi, fig. 2; WASMANN, *Verh. z.-b. Wien*, xli.

*Velleius simillimus*, China, FAIRMAIRE, p. cxc, *C.R. Ent. Belg.* xxxv, n. sp.

*Xantholinus punctulatus*, p. 175, *glabratus*, p. 179, larvæ described; XAMBEU, *Ann. Soc. L. Lyon*, xxxviii.

*X. corallipes*, Venezuela, FAUVEL, p. 105, *Rev. d'Ent.* x, n. sp.

<sup>4</sup>*Xenogaster*, n. g., near *Calodera*, p. 651, for *X. inflata*, n. sp., Blumenau, p. 652, pl. vi, fig. 16; WASMANN, *Verh. z.-b. Wien*, xli.

#### PSELAPHIDÆ.

[*Cf.* BLACKBURN (74, 75), FAUVEL (271), FLACH (281), GUILLEBEAU (356), RAFFRAY (679), REITTER (694, 697, 698), WASMANN (929).]

<sup>4</sup>*Anasis*, n. subg. of *Bryaxis*, p. 492, for *B. (A.) levicollis*, n. sp., Philippines, p. 493, pl. xiv, fig. 21, RAFFRAY, *Ann. Soc. Ent. Fr.* 1891.

*Batrissus cavicola*, p. 476, pl. xiv, fig. 1, *verticinus*, p. 477, *B. (Batrisodes) squamiceps*, fig. 2, p. 478, *tumidipes*, fig. 4, p. 479, *clavipes*, fig. 3, *hamatipes*, fig. 5, p. 480, Philippine Is., RAFFRAY, *Ann. Soc. Ent. Fr.* 1891, n. spp.

*Bryaxis rufa* and allies, synonymy discussed; RAFFRAY, pp. 484 & 486, *Ann. Soc. Ent. Fr.* 1891.

*Bryaxis lindensis*, p. 77, *harti*, p. 78, *inuitata*, p. 79, S. Australia, *ovensensis*, Victoria, p. 80, *paludis*, S. Australia, p. 81; BLACKBURN, *Tr. R. Soc. S. Austr.* xiv; *B. (Reichenbachia) tubericollis*, p. 485, pl. xiv, fig. 20, *budha*, fig. 9, p. 487, *loti*, fig. 12, p. 488, *B. castelnaudi*, fig. 13, p. 489, *manillensis*, fig. 14, p. 490, *laticollis*, fig. 15, p. 491, *dama*, fig. 17, p. 492, Philippines, RAFFRAY, *Ann. Soc. Ent. Fr.* 1891 : n. spp.

*Bythinus grilati*, *baudueri*, *ravouxi*, characters of; FAUVEL, pp. 19 & 20, *Rev. d'Ent.* x.

*B. serripes*, Hérault, FAUVEL, p. 18, *Rev. d'Ent.* x; *B. sculpticornis*, Valais, GUILLEBEAU, p. 17, *t. c.*; *B. lictor*, Como, FLACH, p. 230, *Wien. ent. Z.* x : n. spp.

*Chennium semenowi*, New Margelan, REITTER, p. 196, *Wien. ent. Z.* x, n. sp.

*Claviger testaceus*, habits; WASMANN, *S. E. Z.* 1891, pp. 6-9.

*Ctenistes marthæ*, Ordubad, REITTER, p. 19, *Deutsche e. Z.* 1891. *C. andersoni*, S. Australia, BLACKBURN, p. 77, *Tr. R. Soc. S. Austr.* xiv : n. spp.

*Eupines*, King : characters and composition discussed; BLACKBURN, pp. 81 & 82, *Tr. R. Soc. S. Austr.* xiv.

*E. sororcula*, p. 82, *nauta*, p. 83, *nautoides*, *spiniventris*, p. 84, *militaris*, p. 85, Australia, BLACKBURN, *t. c.*; *E. relictæ*, Victoria, *id. t. c.* p. 292 : n. spp.

*Euplectus crassipes*, Philippines, RAFFRAY, p. 475, Ann. Soc. Ent. Fr. 1891, n. sp.

*Pselaphoptrus*, n. g., near *Pselaphus*, p. 139, for *P. kubischteki*, n. sp., Ordubad, p. 140, REITTER, Wien. ent. Z. x.

*Reichenbachia akinini*, Taschkent, REITTER, p. 19, Deutsche e. Z. 1891, n. sp.

*Rhynchoclaviger*, n. g., p. 4, for *R. cremastogastris*, n. sp., Madagascar, p. 5, pl. i, fig. 1; WASMANN, S. E. Z. 1891.

*Rybaxis gladiator*, p. 481, pl. xiv, fig. 7, *simoniana*, p. 482, Philippines, RAFFRAY, Ann. Soc. Ent. Fr. 1891, n. spp.

*Sognorus croissandeaui*, Turcomania, REITTER, p. 139, Wien. ent. Z. x, n. sp.

*Tmesiphorus simoni*, Philippines, RAFFRAY, p. 495, Ann. Soc. Ent. Fr. 1891, n. sp.

*Tyraphus bueri*, Philippines, p. 493, *pilosus*, Tonkin, p. 494, RAFFRAY, Ann. Soc. Ent. Fr. 1891, n. spp.

#### SCYDMÆNIDÆ.

[Cf. FAUVEL (272), FLACH (281), REITTER (694, 697, 703), SCHAUFUSS (765, 767).]

*Cephennium*: REITTER criticises at length Croissandeau's synonymical remarks in Coléoptérologiste, i, p. 50; Wien. ent. Z. x, pp. 56-58.

*Chevolatia grouvellei*, Mexico, SCHAUFUSS, p. 33, Ent. Nachr. xvii, n. sp.

*Cyrtoscydmus fundabraccatus*, p. 333, *manillæ*, p. 335, Philippines, SCHAUFUSS, Ann. Soc. Ent. Fr. 1891, n. spp.

*Euconnus helenæ*, Como, FLACH, p. 231, Wien. ent. Z. x; *E. turcomanus*, Syr-Darja, REITTER, p. 141, t. c.; *E. schönfeldti*, Japan, id. p. 20, Deutsche e. Z. 1891: n. spp.

*Eumicrus gigas*, n. n. for *giganteus*, Schauf., nec Fauv.; SCHAUFUSS, p. 20, Rev. d'Ent. x.

*Neuraphes* (*Pararaphes*) *cantalicus*, France, FAUVEL, p. 58, Rev. d'Ent. x; *N. gestroi*, Genoa, FLACH, p. 231, Wien. ent. Z. x; *N. stussineri*, Calabria, REITTER, p. 246, t. c.: n. spp.

*Scydmænus antipolensis*, Philippines, SCHAUFUSS, p. 335, Ann. Soc. Ent. Fr. 1891, n. sp.

#### PAUSSIDÆ.

[Cf. BLACKBURN (74), DOHRN (200, 204), POUJADE (662).]

*Lebioderus javanus*, Java, DOHRN, p. 236, S. E. Z. 1891, n. sp.

*Paussus sikorai*, Madagascar, POUJADE, Bull. Soc. Ent. Fr. 1891, p. xxxvi; the name changed to *grandidieri*, p. lii, t. c.; *P. (Platyrhopalus) benevolus*, Bahr el Abiad, p. 387, *P. (Cerapteris) laceratus*, S. Africa, p. 388, DOHRN, S. E. Z. 1891; *P. australis*, Queensland, BLACKBURN, p. 68, Tr. R. Soc. S. Austr. xiv: n. spp.

## SILPHIDÆ.

[*Cf.* BEDEL (47), BLACKBURN (74), FAIRMAIRE (261), JAKOWLEFF (437), REITTER (694), SEMENOW (797), SHARP (963).]

*Aclypea semenowi*, Lake Issyk-kul, JAKOWLEFF, p. 125, Hor. Ent. Ross. xxv, n. sp.

*Bathyscia meridionalis*, Duv., redescribed; LARCENNE, Feuille. Nat. xxi, p. 36.

*Blitophaga capitata*, Irkutsk, p. 124, *vicina*, Turkestan, p. 125, JAKOWLEFF, Hor. Ent. Ross. xxv, n. spp.

*Choleva antipodum*, Victoria, *adelaidæ*, S. Australia, p. 87, *victoriensis*, Victoria, *minuscule*, S. Australia, p. 88, BLACKBURN, Tr. R. Soc. S. Austr. xiv, n. spp.

*Cholevomorpha*, n. g., p. 89, for *C. picta*, n. sp., Victoria, p. 90; BLACKBURN, Tr. R. Soc. S. Austr. xiv.

*Cyrtusa inflatipes*, Ordubad, REITTER, p. 20, Deutsche e. Z. 1891, n. sp.

*Eusilpha*, n. subg. of *Silpha*, for *S. (E.) jakolewi*, n. sp., Gan-ssu; SEMENOW, p. 299, Hor. Ent. Ross. xxv.

*Leptinus testaceus*, notes on; HAMILTON, Canad. Ent. xxiii, pp. 183-185.

*Necrophorus rugulipennis*, China, p. 126, *funebri*, *argutor*, Mongolia, p. 127, JAKOWLEFF, Hor. Ent. Ross. xxv, n. spp.

*Pteroloma anglorossica*, Kandschut, SEMENOW, p. 297, Hor. Ent. Ross. xxv; *P. davidis*, China, FAIRMAIRE, p. cxc, C.R. Ent. Belg. xxxv : n. spp.

*Silpha obscura*, L., n. var. *simplex*; SEMENOW, p. 297, Hor. Ent. Ross. xxv.

*S. (Thanatophilus) grilati*, Algeria, BEDEL, p. xxxvii, Bull. Soc. Ent. Fr. 1891; *S. validior*, S. Turkestan, p. 297, *S. (Aclypea) plana*, Chinese Turkestan, p. 298, *S. (Thanatophilus) porrecta*, Chinese Turkestan, p. 301, *dentigera*, Thibet, p. 303, SEMENOW, Hor. Ent. Ross. xxv; *cf.* also *Eusilpha*; *S. microps*, Ecuador, SHARP in Whympers Supp. App. p. 40 : n. spp.

## TRICHOPTERYGIDÆ and SCAPHIDIIDÆ.

[*Cf.* BLACKBURN (74), FAUVEL (275), REITTER (694), SCHAUFUSS (768).]

*Actinopteryx lancifer*, New Caledonia, FAUVEL, p. 148, Rev. d'Ent. x, n. sp.

*Trichopteryx montivaga*, Madagascar, SCHAUFUSS, p. 1, Tijdschr. Ent. xxxiv, n. sp.

*Scaphidium alpicola*, Victoria, BLACKBURN, p. 90, Tr. R. Soc. S. Austr., n. sp.

*Scaphisoma curvistris*, Sea of Aral, REITTER, p. 22, Deutsche e. Z. 1891; *S. novicum*, Victoria, BLACKBURN, p. 92, Tr. R. Soc. S. Austr. xiv : n. spp.

## HISTERIDÆ.

[Cf. BLACKBURN (74), FAUVEL (275), LEWIS (528, 529, 530, 531, 532, 533).]

Characters of the species known from New Caledonia; FAUVEL, pp. 164-170, Rev. d'Ent. x.

*Abraeus acicularis*, p. 168, *punctiger*, p. 169, New Caledonia, FAUVEL, Rev. d'Ent. x, n. spp.

*Apobletes duvivieri*, Congo, p. 381, *semperi*, Philippine Is., *platysomoides*, Tenasserim, p. 382, *corticalis*, Perak, p. 383, *semirufus*, Bahia, p. 384, LEWIS, Ann. N. H. (6) viii, n. spp.

*Baconia festiva*, Bahia, LEWIS, p. 389, Ann. N. H. (6) viii, n. sp.

*Carcinops dulcis*, Sumatra, LEWIS, p. 389, Ann. N. H. (6) viii, n. sp.

*Chlamydopsis*; generic characters and identity with *Byzenia* discussed; BLACKBURN, p. 92, Tr. R. Soc. S. Austr. xiv.

*C. sternalis*, p. 93, *inæqualis*, p. 94, S. Australia, BLACKBURN, Tr. R. Soc. S. Austr. xiv, n. spp.

*Colonides parvulus*, Mexico, LEWIS, p. 404, Ann. N. H. (6) viii, n. sp.

*Epiechnus*, n. g., type *Onthophilus costipennis*, Fähr.; LEWIS, Ent. M. M. (2) ii, p. 319.

*Epierus duz*, p. 387, *imitans*, p. 388, Madagascar, LEWIS, Ann. N. H. (6) viii, n. spp.

*Eretmotus carinatus*, Algeria, LEWIS, p. 394, Ann. N. H. (6) viii, n. sp.

*Heterius brunnipennis*, habits: LIEBECK, Ent. News, ii, p. 120.

*Hister recurvus*, characters noticed; LEWIS, p. 386, Ann. N. H. (6) viii.

*H. sikoræ*, Madagascar, LEWIS, p. 387, Ann. N. H. (6) viii; *H. vestitus*, Burma, LEWIS, Ent. M. M. (2) ii, p. 187; *H. latistrius*, Mexico, *id. t. c.* p. 106: n. spp.

*Liopygus*, n. g., p. 385, for some species hitherto placed in *Apobletes* and *Platysoma*; LEWIS, p. 385, Ann. N. H. (6) viii.

*Onthophilus bipartitus*, Lew., noted as distinct from *costipennis*, Fähr.; LEWIS, p. 404, Ann. N. H. (6) viii.

*O. punctisternum*, Zanzibar, LEWIS, p. 403, Ann. N. H. (6) viii, n. sp.

*Pachycrærus violaceipennis*, Congo, LEWIS, p. 386, Ann. N. H. (6) viii, n. sp.

*Paratropus*: this name must replace *Phylloscelis*, Mars.; LEWIS, p. 390, Ann. N. H. (6) viii.

*P. manicatus*, p. 390, *castaneus*, p. 391, Mexico, *effertus*, *dædalus*, p. 392, *anthracinus*, p. 393, Bahia, LEWIS, Ann. N. H. (6) viii, n. spp.

*Paromalus goliath*, Burma, LEWIS, p. 187, Ent. M. M. (2) ii, n. sp.

*Phelister cardoni*, Bengal, LEWIS, p. cxxxvi, C.R. Ent. Belg. xxxv, n. sp.

*Platysoma montroussieri*, Perr., = (*perroudi*, Mars.); FAUVEL, p. 165, Rev. d'Ent. x.

*P. solitarium*, p. 384, Borneo, *constrictum*, N. W. Australia, p. 385, LEWIS, Ann. N. H. (6) viii; *P. foveolatum*, *lucillum*, Burma, LEWIS, p. 186, Ent. M. M. (2) ii; *P. connexum*, New Caledonia, FAUVEL, p. 166, Rev. d'Ent. x: n. spp.

♂ *Saprinodes*, n. g., p. 395, for *S. falcifer*, n. sp., Queensland, p. 396, LEWIS, Ann. N. H. (6) viii.

*Saprinus cruciatus*, Fab., = (*flavipennis*, Pér.); LEWIS, p. 395, Ann. N. H. (6) viii. *S. brunnensis*, habits noticed; FLEISCHER, p. 230, Wien. ent. Z. x.

*Sternaulax caledoniæ*, New Caledonia, FAUVEL, p. 164, Rev. d'Ent. x, n. sp.

*Sternocælis*, structure of claws and geographical distribution noticed; LEWIS, Ent. M. M. (2) ii, pp. 161 & 162.

*Tetriosoma viridicatum*, p. 396, *cingulum*, p. 397, Bahia, *nigrescens*, Mexico, *grouvellei*, Bahia, p. 398, *plumicornis*, British Honduras, *pilicornis*, Central America, p. 399, LEWIS, Ann. N. H. (6) viii, n. spp.

*Triballus corylophoides*, Sumatra, LEWIS, p. 395, Ann. N. H. (6) viii, n. sp.

*Trichorenius*, n. g., near *Reninus*, p. 106, for *T. flohri*, n. sp., Mexico, p. 107, LEWIS, Ent. M. M. (2) ii.

*Trypeticus grouvellei* and *tabaciglescens*, Mars., are one species, to be called *grouvellei*; LEWIS, p. 402, Ann. N. H. (6) viii.

*T. obeliscus*, p. 402, *minutulus*, p. 403, Sumatra, LEWIS, Ann. N. H. (6) viii, n. spp.

*Tryponæus doherityi*, Burma, LEWIS, Ent. M. M. (2) ii, p. 188; *T. rostratus*, Peru, p. 400, *plagiatus*, Rio Janeiro, *fasciatus*, Bahia, p. 401, LEWIS, Ann. N. H. (6) viii : n. spp.

#### PHALACRIDÆ.

[Cf. BLACKBURN (74), REITTER (694).]

*Litochrus laticulus*, *palmerstoni*, *alternans*, p. 95, *maculatus*, *sutrellus*, p. 96, *lateralis*, *frigidus*, p. 97, *L. ? alticola*, *uniformis*, p. 98, Australia, BLACKBURN, Tr. R. Soc. S. Austr., n. spp.

*Olibrus flachi*, Sea of Aral, REITTER, p. 22, Deutsche e. Z. 1891; *O. victoriensis*, Australia, BLACKBURN, p. 101, Tr. R. Soc. S. Austr. xiv : n. spp.

♂ *Phalacrinus*, n. g., for *P. australis*, p. 99, *obtusus*, *rotundus*, p. 100, n. spp., S. Australia, BLACKBURN, Tr. R. Soc. S. Austr.

*Phalacrus burundiensis*, S. Australia, BLACKBURN, p. 101, Tr. R. Soc. S. Austr., n. sp.

#### NITIDULIDÆ.

[Cf. BLACKBURN (74), FAIRMAIRE (261), GROUVELLE (353, 354), OLLIFF (963), SCHAUFUSS (768), SHARP (337).]

*Æthina concolor*, pl. xi, fig. 6, p. 350, *quadrata*, fig. 7, p. 351, Central America, SHARP, Biol. Centr. Am. Col. ii (1), n. spp.

♂ *Æthinodes*, n. g., near *Lasiodactylus*, for *Æ. marmoratum*, n. sp., Tropical Australia, BLACKBURN, p. 109, Tr. R. Soc. S. Austr. xiv.

*Amphicrossus horni*, pl. xi, fig. 5, *limbatus*, Guatemala, SHARP, p. 349, Biol. Centr. Am. Col. ii (1), n. spp.



*Brachypeplus (Liparoepelus) simoni*, Venezuela, GROUVELLE, p. 313, Ann. Soc. Ent. Fr. 1891, n. sp.

*Cumtodes vittatus*, Er., = (*rubripennis*, Reitt.); GROUVELLE, p. ciii, Bull. Soc. Ent. Fr. 1891. *C. communis*, n. var. *vilis*; SHARP, p. 337, Biol. Centr. Am. Col. ii (1).

*C. externus*, p. 337, *cognatus*, p. 338, pl. x, fig. 25, *pyxis*, *biformis*, pl. xi, fig. 1, p. 339, *nigrinus*, p. 340, *heterocheilus*, *addendus*, p. 341, *laticornis*, *sordidus*, p. 342, *erythroderus*, *terminalis*, p. 343, *maurus*, *iteratus*, *dimorphus*, p. 344, *furcatus*, pl. xi, fig. 2, *signaticollis*, p. 345, *mexicanus*, *armatus*, p. 346, *latipes*, fig. 3, *chiriquensis*, fig. 4, p. 347, *diffinis*, *masculinus*, p. 348, Central America, SHARP, Biol. Centr. Am. Col. ii (1), n. spp.

*Cercometes andicola*, Ecuador, OLLIFF, in Whympers Supp. App. p. 58, n. sp.

*Conotelus fuscipennis*, Er., = (*nitidus*, Reitt.); GROUVELLE, p. ciii, Bull. Soc. Ent. Fr. 1891.

*Cryptarcha longidens*, p. 374, pl. xii, fig. 7, *guatemalena*, *sanguinea*, *nigra*, fig. 8, p. 375, *furcata*, p. 376, *inæqualis*, fig. 9, *brevidens*, fig. 10, *gentilis*, p. 377, *subtilis*, fig. 11, *gibbula*, p. 378, *morata*, *regularis*, fig. 12, *plena*, fig. 13, p. 379, *cephalotes*, *puncticeps*, fig. 14, p. 380, *clavigera*, *discedens*, fig. 15, p. 381, *comma*, p. 382, *imbellis*, *costaricensis*, *atomaria*, fig. 16, p. 383, Central America, SHARP, Biol. Centr. Am. Col. ii (1), n. spp.

<sup>1</sup>*Cyclocaccus*, n. g., for *C. monticola*, *brevicollis*, p. 361, *laticulus*, p. 362, n. spp., Central America, SHARP, Biol. Centr. Am. Col. ii (1).

<sup>1</sup>*Eusphærius*, n. g., *Strongylinx*, p. 371, for *E. godmani*, pl. xii, fig. 5, *scutellatus*, *rubicundus*, n. spp., Central America, p. 372, SHARP, Biol. Centr. Am. Col. ii (1).

*Gliscrochilus (Ips) quadripunctatus*, L., = (*quadripustulatus*, L.); G. (Librodor) *olivieri*, n. n. for *quadripunctatus*, Ol.; BEDEL, p. 153, L'Ab. xxvii.

*Haptoncura victoriensis*, *lindensis*, p. 103, *meyricki*, *uniformis*, p. 104, BLACKBURN, Tr. R. Soc. S. Austr., n. spp.

*Hebascus*, characters and systematic position noticed; SHARP, p. 352, Biol. Centr. Am. Col. ii (1).

*H. mexicanus*, *bugabensis*, pl. xi, fig. 9, p. 352, *aurantiacus*, fig. 10, *trilli*, *erinaceus*, fig. 11, p. 353, Central America, SHARP, Biol. Centr. Am. Col. ii (1), n. spp.

*Idethina cincta*, S. Australia, BLACKBURN, p. 107, Tr. R. Soc. S. Austr. xiv, n. sp.

<sup>1</sup>*Idosoronia*, n. g., near *Soronia*, for *I. picta*, n. sp., Madagascar, SCHAUFFUSS, p. 4, Tijdschr. Ent. xxxiv.

*Ips ultimus*, Mexico, SHARP, p. 387, pl. xii, fig. 21, Biol. Centr. Am. Col. ii (1), n. sp.

*Lasiodactylus marginatus*, n. var. *P. obscurus*, BLACKBURN, p. 106, Tr. R. Soc. S. Austr. xiv.

<sup>1</sup>*Lepiarcha*, n. g., for *Cryptarcha omositoides*, Reitt. (figured, pl. xii, fig. 18); SHARP, p. 385, Biol. Centr. Am. Col. ii (1).

↓ *Liarcha*, n. g. *Ipsinae*, for *L. placida*, n. sp., Central America, pl. xii, fig. 19; SHARP, Biol. Centr. Am. Col. ii (1).

*Macroura deceptor*, S. Australia, *baileyi*, Queensland, BLACKBURN, p. 108, Tr. R. Soc. S. Austr. xiv, n. spp.

↓ *Mecyllodes*, n. g. near *Strongylus*, p. 357, for *M. clavicornis*, pl. xi, fig. 18, *nigropictus*, n. spp., Central America, p. 358, SHARP, Biol. Centr. Am. Col. ii (1).

↓ *Meoncerus*, n. g., p. 358, for *M. salvini*, pl. xi, fig. 19, *seriatus*, n. spp., Central America, p. 359; SHARP, Biol. Centr. Am. Col. ii (1).

*Micrurula subopaca*, Alai, REITTER, p. 24, Deutsche e. Z. 1891, n. sp.

*Omosiphora costata*, Madagascar, SCHAUFUSS, p. 6, Tijdschr. Ent. xxxv, n. sp.

*Oxycnemus rostratus*, ♂ figured and noticed, p. 362, pl. xi, fig. 22; SHARP, Biol. Centr. Am. Col. ii (1).

*Pallodes reversus*, pl. xi, fig. 24, *mexicanus*, p. 365, *micans*, *strongyliformis*, fig. 25, p. 366, *signaticollis*, *sellatus*, *deletus*, p. 367, *regularis*, *cercyonoides*, *smithi*, pl. xii, fig. 1, p. 368, *punctatus*, *viridus*, *abdominalis*, p. 369, *pictus*, fig. 2, *guttatus*, fig. 3, p. 370, *filipes*, *obscurus*, fig. 4, p. 371, Central America, SHARP, Biol. Centr. Am. Col. ii (1), n. spp.

*Parametopia concolor*, Bengal, GROUVELLE, p. cccxxxvii, C.R. Ent. Belg. xxxv, n. sp.

*Pityophagus insignis*, Mexico, SHARP, p. 386, p. xii, fig. 20, Biol. Centr. Am. Col. ii (1), n. sp.

↓ *Pleuroneces*, n. g., near *Nitidula*, p. 59, for *P. montanus*, n. sp., Ecuador, p. 60; OLLIFF, in Whympers Supp. App.

*Psilopyga*, Lec., = (*Eugoniopus*), Reitter; SHARP, p. 364, Biol. Centr. Am. Col. ii (1).

*P. fasciata*, Mexico, *id. l. c.*, n. sp.

↓ *Pynocephalus*, n. g. *Cybocephalinae*, for *P. metallicus*, n. sp., Central America, pl. xii, fig. 6; SHARP, p. 373, Biol. Centr. Am. Col. ii (1).

↓ *Pynocnemus*, n. g. near *Oxycnemus*, for *P. anisotomoides*, n. sp., Panama, pl. xi, fig. 23; SHARP, p. 363, Biol. Centr. Am. Col. ii (1).

↓ *Somatoxus*, n. g., p. 359, for *S. sallui*, pl. xi, fig. 20, *hydroporoides*, fig. 21, n. spp., Central America, p. 360; SHARP, Biol. Centr. Am. Col. ii (1).

*Soronia simulans*, Victoria, BLACKBURN, p. 105, Tr. R. Soc. S. Austr. xiv, n. sp.

*Stelidota marginata*, Venezuela, GROUVELLE, p. 314, Ann. Soc. Ent. Fr. 1891, n. sp.

*Strongylus exilis*, Venezuela, GROUVELLE, p. 315, Ann. Soc. Ent. Fr. 1891; *S. unicolor*, pl. xi, fig. 14, *lateralis*, figs. 15 & 16, p. 355, *chiriquensis*, *mollis*, *aqualis*, p. 356, *mimetus*, p. 357, pl. xi, fig. 17, Central America, SHARP, Biol. Centr. Am. Col. ii (1): n. spp.

↓ *Teichostethus*, n. g. near *Hebascus*, for *T. vinosus*, pl. xi, fig. 12, p. 354, *guatemalensis*, fig. 13, p. 355, n. spp., Central America; SHARP, Biol. Centr. Am. Col. ii (1).

✓ *Thalycrodes*, n. g., p. 110, for *T. pulchrum*, p. 111, *cylindricum*, p. 112, n. spp., S. Australia, and including probably *Thalycera australis*, Germ.; BLACKBURN, Tr. R. Soc. S. Austr. xiv.

*Xenostromylus variegatus*, China, FAIRMAIRE, p. cxcii, C.R. Ent. Belg. xxxv, n. sp.

### TROGOSITIDÆ and SYNTELIIDÆ.

[Cf. BLACKBURN (74), FAUVEL (275), KUWERT (505), LÉVEILLÉ (526), SHARP (337).]

*Trogositidæ*: characters of the New Caledonian species; FAUVEL, pp. 158-161, Rev. d'Ent. x.

*Synteliidæ*: the family defined; SHARP, p. 438, Biol. Centr. Am. Col. ii (1).

*Airora suturata*, S. America, LÉVEILLÉ, p. liii, Bull. Soc. Ent. Fr. 1891; *A. yucatanica*, p. 391, pl. xiii, fig. 1, *pollens, centralis*, fig. 2, p. 292, Central America, SHARP, Biol. Centr. Am. Col. ii (1): n. spp.

*Alindria beckeri*, Madagascar, KUWERT, p. 310, Deutsche e. Z. 1891, n. sp.

✓ *Colydobius*, n. g., near *Tenebroides*, for *C. divisus*, pl. xii, fig. 25, *signatus*, n. spp., Central America; SHARP, p. 437, Biol. Centr. Am. Col. ii (1).

✓ *Corticotomus*, n. g., near *Airora*, for *C. basalis*, pl. xii, fig. 24, p. 390, *gracilis*, p. 391, n. spp., Central America; SHARP, Biol. Centr. Am. Col. ii (1).

✓ *Cylidrella*, n. g. *Nemosomatinae*, for *C. mollis*, n. sp., Guatemala, pl. xii, fig. 23; SHARP, p. 389, Biol. Centr. Am. Col. ii (1).

*Eupycnus*, n. g., near *Tenebroides*, p. 415, for *E. lentus*, n. sp., Mexico, p. 416, pl. xiii, fig. 12; SHARP, Biol. Centr. Am. Col. ii (1).

*Neaspis pusilla*, S. Australia, BLACKBURN, p. 112, Tr. R. Soc. S. Austr. xiv, n. sp.

*Nemosoma signatum*, Guatemala, SHARP, p. 388, pl. xii, fig. 22, Biol. Centr. Am. Col. ii (1), n. sp.

*Peltonyxa australis*, S. Australia, *pubescens*, Victoria, BLACKBURN, p. 113, Tr. R. Soc. S. Austr. xiv, n. spp.

*Temnochila digitata*, pl. xiii, fig. 3, p. 393, *leveillæi*, fig. 4, p. 394, *guatemalena*, p. 396, *geminata*, p. 398, *salvini*, fig. 6, p. 399, *præterita*, p. 400, *fraudulenta*, *planicollis*, p. 401, *miranda*, fig. 7, *urbensis*, p. 404, *alticola*, *grandis*, p. 405, *exarata*, *sulcifrons*, fig. 8, *derasa*, p. 406, *smithi*, fig. 9, *diffinis*, p. 407, *querula*, p. 408, *boboensis*, *reversa*, p. 409, *championi*, fig. 10, *costaricensis*, p. 410, *chiriquensis*, fig. 11, *telemansensis*, p. 412, *stipes*, p. 413, *belti*, p. 415, Central America, SHARP, Biol. Centr. Am. Col. ii (1), n. spp.

*Tenebroides celatus*, pl. xiii, fig. 13, *sonorensis*, fig. 14, p. 418, *facilis*, p. 420, *spectator*, p. 421, *oblongus*, *mordax*, p. 423, *undulatus*, fig. 15, p. 424, *alticola*, p. 425, *repetitus*, *zunilensis*, p. 426, *marginicollis*, fig. 16, *instabilis*, p. 427, *iteratus*, *longulus*, p. 428, *auriculatus*, *lucidus*, p. 429, *excellens*,

*sallæi*, p. 430, *godmani*, fig. 17, p. 431, *helophorus*, fig. 18, *pollens*, fig. 19, p. 432, *gracilipes*, fig. 21, p. 433, *sericatus*, *bimaculatus*, fig. 22, p. 434, *complicatus*, fig. 23, *politus*, p. 435, *fulgens*, fig. 24, *merens*, *zapotensis*, fig. 25, p. 436, Central America, SHARP, Biol. Centr. Am. Col. ii (1); *T. sharpi*, n. n. for *bimaculatus*, Shp. (*suprà*), nec Melsh.; LÉVEILLÉ, p. cxcii, Bull. Soc. Ent. Fr. 1891 : n. spp.

## COLYDIIDÆ.

[*Cf.* BLACKBURN (74), FAIRMAIRE (254), REITTER (698), SCHAUFISS, (768), SHARP (805).]

*Bothrideres victoriensis*, Australia, BLACKBURN, p. 117, Tr. R. Soc. S. Austr. xiv, n. sp.

*Cyprogenia laticollis*, Taschkent, REITTER, p. 197, Wien. ent. Z. x, n. sp.

*Ditoma torrida*, Queensland, *nivicola*, Victoria, BLACKBURN, p. 114, Tr. R. Soc. S. Austr. xiv, n. spp.

*Esarcus æbillei* = (*cribratus*, Reitt.) ; REITTER, p. 256, Wien. ent. Z. x.

*Meryx æqualis*, S. Australia, BLACKBURN, p. 115, Tr. R. Soc. S. Austr. xiv, n. sp.

*Pycnomerus vulgaris*, Madagascar, SCHAUFISS, p. 8, Tijdschr. Ent. xxxiv, n. sp.

*Sarrotrium australe*, Victoria, BLACKBURN, Tr. R. Soc. S. Austr. xiv, n. sp.

*Sosylus bistriatus*, Gaboon, FAIRMAIRE, p. 235, Ann. Soc. Ent. Fr. 1891, n. sp.

*Sparactus pustulosus*, *elongatus*, *proximus*, p. 116, *costatus*, p. 117, S. Australia, BLACKBURN, Tr. R. Soc. S. Austr. xiv, n. spp.

\**Syncosmetus*, n. g., for *S. japonicus*, n. sp., Yuyama, p. 7, SHARP, Ent. xxiv, Supp.

## CUCUJIDÆ and CRYPTOPHAGIDÆ.

[*Cf.* BEDEL (48), BLACKBURN (74), FAIRMAIRE (259), GROUVELLE (354), REITTER (694, 698).]

*Hectarthrum simplex*, Murr., = (*corticinum*, Per.) ; GROUVELLE, p. civ, Bull. Soc. Ent. Fr. 1891.

*H. punctulicolle*, E. Africa, FAIRMAIRE, p. cclxxxiii, C.R. Ent. Belg. xxxv, n. sp.

*Læmotmetus insignis*, Bengal, GROUVELLE, p. ccxxxviii, C.R. Ent. Belg. xxxv, n. sp.

*Psammæcus longicornis*, Schauf., = (*longulus*, Grouv.) ; GROUVELLE, p. c, Bull. Soc. Ent. Fr. 1891.

*Silvanus ornatulus*, *monticola*, Victoria, BLACKBURN, p. 118, Tr. R. Soc. S. Austr. xiv, n. spp.

*Atomaria australis*, *lindensis*, S. Australia, BLACKBURN, p. 119, Tr. R. Soc. S. Austr. xiv, n. spp.

*Cryptophagus laterangulus*, Turcomania, REITTER, p. 197, Wien. ent. Z. x ; *C. lindensis*, S. Australia, BLACKBURN, p. 119, Tr. R. Soc. S. Austr. xiv, n. sp.

## LATHRIDIIDÆ, MYCETOPHAGIDÆ, and OTHNIIDÆ.

[Cf. BELON (49), BLACKBURN (74), FAUVEL (275), REITTER (694).]

Characters of the *Lathridiidae* of New Caledonia ; FAUVEL, p. 155-158, Rev. d'Ent. x.

*Corticaria australis*, *adelaidæ*, *lindensis*, p. 120, *andersoni*, *alutacea*, p. 121, S. Australia, BLACKBURN, Tr. R. Soc. S. Austr. xiv, n. spp.

*Holoparamesus lyratus*, Seal of Aral, REITTER, p. 22, Deutsche e. Z. 1891, n. sp.

*Lathridius heteronotus*, Chili, BELON, p. cxxxiv, C.R. Ent. Belg. xxxv, n. sp.

*Metophtthalmus albofasciatus*, Japan, REITTER, p. 23, Deutsche e. Z. 1891, n. sp.

*Platycephala olivieri*, Motr., referred to *Proterhinus* ; FAUVEL, p. 154, Rev. d'Ent. x.

† *Eponomastus*, n. n. for *Symbiotes*, Redt. ; BUYSSON, p. xcv, Bull. Soc. Ent. Fr. 1891 ; but withdrawn, t. c. p. clx.

*Diplöcelus angustulus*, p. 122, *exiguus*, p. 123, S. Australia, BLACKBURN, Tr. R. Soc. S. Austr. xiv.

*Mycetæa pilosella*, S. Australia, BLACKBURN, p. 122, Tr. R. Soc. S. Austr. xiv, n. sp.

*Triphyllus intricatus*, Victoria, BLACKBURN, p. 122, Tr. R. Soc. S. Austr. xiv, n. sp.

*Elacatis krautzi*, ♂ noticed ; LEWIS, Ent. M. M. (2) ii, p. 248.

*E. ocularis*, Japan, LEWIS, l. c., n. sp.

## DERMESTIDÆ, BYRRHIDÆ, HETEROCERIDÆ.

[Cf. BLACKBURN (74), FAIRMAIRE (261), FOWLER (293), KUWERT (506), RITSEMA (732), VARENIUS (890).]

*Byturus oblongulus*, China, FAIRMAIRE, p. cxcii, C.R. Ent. Belg. xxxv, n. sp.

† *Adelaida*, n. g., near *Trogoderma*, for *A. rigua*, n. sp., S. Australia, BLACKBURN, Tr. R. Soc. S. Austr. xiv.

*Anthrenus ocellifer*, *flindersi*, S. Australia, BLACKBURN, p. 132, Tr. R. Soc. S. Austr. xiv, n. spp.

*Tir'sias serra*, larva described ; DECAUX, Le Nat. 1891, p. 26.

*Trogoderma eyrense*, S. Australia, *alpicola*, Victoria, p. 124, *adelaidæ*, *lindense*, p. 125, *difficile*, *macleayi*, p. 126, *occidentale*, W. Australia, *baldinense*, Victoria, *yorkense*, p. 127, *antipodum*, *singulare*, S. Australia, *meyricki*, W. Australia, p. 128, BLACKBURN, Tr. R. Soc. S. Austr. xiv, n. spp.

*Cryptorhopalum australicum*, *woodvillense*, p. 130, *interioris*, p. 131, S. Australia, BLACKBURN, Tr. R. Soc. S. Austr. xiv, n. spp.

*Byrrhus raucus*, Victoria, BLACKBURN, p. 133, Tr. R. Soc. S. Austr. xiv, n. sp.

*Chelonarium dorsale*, JAVA, RITSEMA, p. 249, Notes Leyd. Mus. xiii, n. sp.

*Heterocerus* : Kuwert's Bestimmungstabellen reviewed by KRAATZ, Deutsche e. Z. 1891, pp. 131–133 : Descriptive notes on the British species ; FOWLER, Ent. M. M. (2) ii, pp. 202–207. *H. rectus*, Wat., distinctive characters ; KUWERT, p. 312, Deutsche e. Z. 1891.

*H. mölleri*, Sweden, VARENIUS, p. 22, Ent. Tidskr. xii ; *H. beckeri*, Sarepta, KUWERT, Deutsche e. Z. 1891, p. 311 : *H. victorie*, p. 133, *indistinctus*, p. 134, Victoria, BLACKBURN, Tr. R. Soc. S. Austr. xiv : n. spp.

#### LUCANIDÆ.

[*Cf.* ALBERS (5, 6), DUVIVIER (221), FAIRMAIRE (259, 260, 263), NONFRIED (625), RITSEMA (731), SEMENOW (797).]

Catalogue of the species described as new in the last fifteen years ; NONFRIED, Deutsche e. Z. p. 277.

*Ceruchus atavus*, Kashmir, FAIRMAIRE, p. lxxxviii, C.R. Ent. Belg. xxxv, n. sp.

*Cladognathus umhangi*, Zanzibar, FAIRMAIRE, p. excii, Bull. Soc. Ent. Fr. 1891, n. sp.

*Cyclommatus pasteuri*, Sumatra, p. 233, pl. x, fig. 1, *canaliculatus*, Nias I., p. 235, RITSEMA, Notes Leyd. Mus. xiii, n. spp.

*Dorcus sewertzowi*, S. Turkestan, SEMENOW, p. 309, Hor. Ent. Ross. xxv, n. sp.

*Nigidius semicariosus*, E. Africa, FAIRMAIRE, p. cclxxxiii, C.R. Ent. Belg. xxxv, n. sp.

*Platycerus* and *Systemocerus* : application of these names discussed ; ALBERS, Deutsche e. Z. 1891, pp. 319 & 320.

*Prosopocaelus elegantulus*, Java, ALBERS, p. 76, Deutsche e. Z. 1891 ; *P. ebeninus*, Philippines, ALBERS, p. 367, Deutsche e. Z. 1891 ; *P. congoanus*, W. Africa, DUVIVIER, p. cccxvii, C.R. Ent. Belg. xxxv : n. spp.

*Sclerostomus fasciatus*, Germ., ♂ described ; ALBERS, Deutsche e. Z. 1891, p. 78.

#### PASSALIDÆ.

KUWERT, Deutsche e. Z. 1891, pp. 161, &c., gives a tabulation of the genera and species of the family, with upwards of 200 new names. The sketch is said to be merely preliminary to a more extensive systematic work, and as the novelties cannot be considered to be sufficiently described in the present outline, we do not mention the names of the species, but only such generic names as appear to be new, and which are as follows :—

*Tiberius*, *Tarquinius*, p. 164, *Episphenoides*, p. 165, *Heterochilus*, p. 166, *Analaches*, *Epilaches*, p. 167, *Aurelius*, p. 168, *Verroides*, *Valerius*, p. 175, *Cassius*, *Lucilius*, p. 176, *Pertinacides*, p. 178, *Epipertinax*, *Ninoides*, *Neleups*, p. 179, *Manlius*, p. 182, *Eriosternus*, p. 183, *Phoroncosomus*, *Tetraracus*, p. 184, *Flaminius*, p. 185, *Eumelosomus*, p. 190, *Didimoides*, *Vitellinus*, p. 191, KUWERT, t. c. n. gg. (insufficiently characterised).

## SCARABÆIDÆ.

[Cf. BATES (34, 35, 963), BINET (72), BLACKBURN (74, 75), BRENSKE (89 to 92), DUVIVIER (221), FAIRMAIRE (254, 259, 260, 261), HELLER (380), JAKOWLEFF (437), KOLBE (479), KOSHANTSCHIKOFF (484), KRAATZ (487, 491), MONIEZ (597), NEVINSON (616), NONFRIED (623, 624), QUEDENFELDT (672), REITTER (692, 694, 702, 705), RIVERS (736), SCHAUFUSS (767), SEMENOW (797), SHARP (806), SMITH (826), WATERHOUSE (937, 938, 939) ; also *Cetoniin*, p. 118.]

*Coprini and Glaphyrini.*

† *Ahermes*, n. g., for *Mendidius rufescens*, Reitt. ; REITTER, p. 254, Wien. ent. Z. x.

*Anthypna fairmairei, dubia*, Gan-ssu, SEMENOW, Hor. Ent. Ross. xxv, p. 330, n. spp.

*Aphodius explanatus*, characters of ; HAMILTON, p. 61, Canad. Ent. xxiii.

*A. makowskyi*, p. 438, *grombcewskyi*, p. 439, Turkestan, KOSHANTSCHIKOFF, Hor. Ent. Ross. xxv ; *A. agar*, Yangihissar, p. 43, *kashmirensis*, Kashmir, p. 44, *tenuimanus*, Central Asia, p. 45, SHARP, Col. Sec. Yark. Miss. : n. spp.

† *Arrhephora*, n. g., near *Amphicoma*, for *A. chalcocorysea*, p. viii, *dolorosa, corinthia*, p. ix, n. spp., China ; FAIRMAIRE, C.R. Ent. Belg. xxxv : characters amended ; *id. t. c.* p. cxcv.

*Atenius speculator*, Victoria, *palmerstoni*, S. Australia, BLACKBURN, p. 135, Tr. R. Soc. S. Austr. xiv, n. spp.

*Aulonocnemis vulgaris*, Madagascar, SCHAUFUSS, p. 111, Ent. Nachr. xvii, n. sp.

*Bolboceras cycloidum*, E. Africa, FAIRMAIRE, p. cclxxxv, C.R. Ent. Belg. xxxv ; *B. davidis, apicatum*, China, FAIRMAIRE, p. vi, C.R. Ent. Belg. xxxv : n. spp.

† *Brenskeia*, n. g., near *Mendidius*, p. 254, for *B. coronata*, n. sp., Turkestan, p. 255 ; REITTER, Wien. ent. Z. x.

*Catharsius semirubidus*, p. 235, *rubidus, auberti*, p. 236, *abortivus*, p. 237, Tropical Africa, FAIRMAIRE, Ann. Soc. Ent. Fr. 1891 ; *C. jacksoni*, E. Africa, p. 509, *anderseni*, Lake Nyassa, *opacus*, Lake Ngami, p. 510, WATERHOUSE, Ann. N. H. (6) vii : n. spp.

*Cleotus tubericauda*, Ecuador, BATES, in Whympers Supp. App. p. 26, n. sp.

*Copris sodalis*, Wlk., and *sinicus*, Hope, note on the types of, p. 512, *orion, amyntor*, Kl., and allies characters of, p. 516, *signatus*, Wlk., is the same as *Catharsius coronatus*, Har., p. 520 ; WATERHOUSE, Ann. N. H. (6) vii.

*C. potanini*, Gan-ssu, SEMENOW, p. 310, Hor. Ent. Ross. xxv ; *C. megaceratoides*, Senegambia, p. 511, *globulipennis*, C. G. Hope, p. 512, *capensis*, S. Africa, *lunarioides*, Abyssinia, p. 513, *morgani*, Sierra Leone, p. 514, *harrisi*, Abyssinia, p. 515, *gracilis*, Caffraria, *diversus*, Madagascar, p. 518, *nevinsoni*, Siam, p. 519, *davisoni*, Malabar, p. 520, *excisus*, N. India, *andrewesi*, E. India, p. 521, WATERHOUSE, Ann. N. H. (6) vii, n. spp.

*Dendropemon telephus*, p. 55, *refulgens*, Cayenne, *smaragdinus*, Bahia, p. 56, *angustipennis*, Amazons, p. 57, *lobatus*, Brazil, p. 58, WATERHOUSE, Ann. N. H. (6) viii, n. spp.

*Geotrupes foveatus* var. described; SHARP, Col. Sec. Yark. Miss.

*G. kashmirensis*, Kashmir, SHARP, p. 46, Col. Sec. Yark. Miss.; *G. semicribrosus*, *crenulipennis*, Kashmir, FAIRMAIRE, p. cxxii, C.R. Ent. Belg. xxxv; *G. jakolewi*, S. Turkestan, SEMENOW, p. 314, Hor. Ent. Ross. xxv; *G. kuluensis*, E. India, BATES, Ent. xxiv, Supp. p. 13; *G. compressidens*, China, FAIRMAIRE, p. vi, C.R. Ent. Belg. xxxv; *G. (Ceratotrupes?) serricornis*, Sze-chuen, BATES, Ent. xxiv, Supp. p. 73 : n. spp.

*Glaphyrus haroldi*, Tripolis, QUEDENFELDT, Ent. Nachr. xvii, p. 131, n. sp.

*Gromphas* (as *Gomphas*) *lemoinei*, Caracas, WATERHOUSE, p. 60, Ann. N. H. (6) viii, n. sp.

*Gymnopleurus sinuatus* var., = (*morosus* Fairm.) ; BATES, Ent. xxiv, Supp. p. 73.

*G. lugens*, E. Africa, FAIRMAIRE, p. cclxxxiv, C.R. Ent. Belg. xxxv, n. sp.

*Heliocopris hunteri*, E. Africa, *operosus*, Africa, WATERHOUSE, p. 508, Ann. N. H. (6) vii, n. spp.

*Lethrus raymondi*, Reitt., and *rotundicollis*, Fairm., distinctions of females of; REITTER, p. 227, Wien. ent. Z. x.

*L. appendiculatus*, Transcaspian region, JAKOWLEFF, p. 122, Hor. Ent. Ross. xxv, n. sp.

*Machidius pilosus*, W. Australia, BLACKBURN, Tr. R. Soc. S. Austr. xiv, n. sp.

*Mendilius bidens*, Solsky, = (*Aphodius bispinifrons*, Reitt.) ; REITTER, p. 228, Wien. ent. Z. x.

*M. willbergi*, Margelan, REITTER, p. 255, Wien. ent. Z. x, n. sp.

*Ochodæus*, table of the characters of the palæarctic species; SEMENOW, pp. 312 & 313, Hor. Ent. Ross. xxv.

*O. solskii*, Transcaspian region, SEMENOW, p. 311, Hor. Ent. Ross. xxv, n. sp.

*Oniticellus imbellis*, E. India, BATES, Ent. xxiv, Supp. p. 13; *O. pictisternum*, p. cxciii, *bucerus*, *concavicollis*, p. cxciv, China, FAIRMAIRE, C.R. Ent. Belg. xxxv : n. spp.

*Onitis meyeri*, Central Africa, KOLBE, p. 21, S. E. Z. 1891; *O. tricornutus*, E. Africa, FAIRMAIRE, p. cclxxxv, C.R. Ent. Belg. xxxv : n. spp.

*Ontherus æquatorius*, Ecuador, BATES, in Whympers Supp. App. p. 25; *O. thoracicus*, New Granada, p. 356, *nevinsoni*, Bolivia, *elongatus*, Venezuela, p. 357, *bridgesi*, Bolivia, p. 358, WATERHOUSE, Ann. N. H. (6) vii : n. spp.

*Onthocharis*: legs of 11 species figured; WATERHOUSE, pl. xi, Ann. N. H. (6) vii.

*O. brevipes*, p. 350, *æqualis*, *leta*, p. 351, Amazons, *oblonga*, *westwoodii*, Brazil, p. 352, *constricta*, p. 353, *lacordairei*, Cayenne, *batesii*, *intermedia*, p. 354, *simplex*, p. 355, Amazons, *bella*, Cayenne, p. 356, WATERHOUSE, Ann. N. H. (6) vii, n. spp.



*Onthophagus concolor*, Shp., sexual forms described ; BATES, Ent. xxiv, Supp. p. 12. *O. tridens*, Fab., ♂ described ; FAIRMAIRE, p. cclxxxv, C.R. Ent. Belg. xxxv.

*O. bedeli*, p. 241, *imitator*, p. 242, Algeria, *felschei*, E. Europe and W. Asia, p. 243, *weisei*, Caucasus, *ganglbaueri*, Servia, p. 244, *koshantschikoffi*, Taschkent, *circulator*, Syria, p. 245, REITTER, Wien. ent. Z. x ; *O. kili-manus*, Central Africa, KOLBE, p. 22, S. E. Z. 1891 ; *O. rectefurcatus*, Tropical Africa, FAIRMAIRE, p. 237, Ann. Soc. Ent. Fr. 1891 ; *O. concolor*, Sind Valley, SHARP, p. 43, Col. Sec. Yark. Miss. ; *O. furcillifer*, *expansicornis*, *ramosellus*, p. 11, *kuluensis*, p. 12, E. India, BATES, Ent. xxiv, Supp. ; *O. lampromelus*, *expansicollis*, China, FAIRMAIRE, p. cxci, C.R. Ent. Belg. xxxv : n. spp.

*Litocopris*, n. g., p. 53, for a part of *Copris*, and including *L. punctiventris*, n. sp., Senegambia, p. 54 ; WATERHOUSE, Ann. N. H. (6) viii.

*Megatharsis*, n. g., near *Bolbites*, p. 59, for *M. buckleyi*, n. sp., Ecuador, p. 60 ; WATERHOUSE, Ann. N. H. (6) viii.

*Phanæus leander*, Colombia, p. 128, *horus*, Brazil, p. 129, WATERHOUSE, Ann. N. H. (6) vii ; *P. boucardi*, p. 208, *cupricollis*, p. 209, Nicaragua, NEVINSON, Ent. M. M. (2) ii : n. spp.

*Pinotus andicola*, Har., ♀ is *Copris triangulariceps*, Bl., p. 360, *P. torulosus*, variation noticed, p. 361 ; WATERHOUSE, Ann. N. H. (6) vii.

*P. buckleyi*, Ecuador, *haroldi*, Cordoba, p. 359, *nitidissimus*, Bolivia, p. 360, *bicornis*, Peru, p. 361, *speciosus*, *agesilaus*, Brazil, *nobilis*, Uruguay, p. 362, WATERHOUSE, Ann. N. H. (6) vii, n. spp.

*Scatonomus thalassinus*, Brazil, WATERHOUSE, p. 350, Ann. N. H. (6) vii, n. sp.

*Sisyphus major*, *trochantericus*, E. Africa, FAIRMAIRE, p. cclxxxiv, C.R. Ent. Belg. xxxv, n. spp.

*Toxocerus*, n. g., near *Anthypna*, for *T. rothschildi*, n. sp., China ; FAIRMAIRE, p. vii, C.R. Ent. Belg. xxxv.

*Trox montanus*, p. 22, *setulosus*, p. 23, Central Africa, KOLBE, S. E. Z. 1891, n. spp.

*Uroxys latesuleatus*, Ecuador, BATES, in Whympers Supp. App. p. 24 ; *U. brevis*, *terminalis*, Brazil, p. 348, *simplex*, Venezuela, p. 349, WATERHOUSE, Ann. N. H. (6) vii : n. spp.

### *Melolonthini.*

*Acoma*, Casey : the systematic position is near *Pleocoma* ; HORN, p. 41, Tr. Am. Ent. Soc. xviii.

*Anomalophylla moupinea*, China, FAIRMAIRE, p. cxcviii, C.R. Ent. Belg. xxxv, n. sp.

*Anoxia rosinae*, Cuenca, REITTER, p. 36, Deutsche e. Z. 1891, n. sp.

*Apogonia* : catalogue of the described species ; RITSEMA, pp. xciii-xcvi, Tijdschr. Ent. xxxiv.

*A. mediocris*, Central Africa, KOLBE, p. 33, S. E. Z. 1891 ; *A. virescens*, *congoana*, W. Africa, DUVIVIER, p. ccccxviii, C.R. Ent. Belg. xxxv : n. spp.

*Astena producta*, Ecuador, BATES, in Whymper Supp. App. p. 26, n. sp.  
*Chioneosoma*, n. g., for *Rhizotrogus pulvereus* and allies; KRAATZ, p. 354, Deutsche e. Z. 1891.

*Clavipalpus antisanae*, p. 27, *whymperi*, p. 28, Ecuador, BATES, in Whymper Supp. App., n. spp.

*Cyphochilus costulatus*, Sze-chuen, BATES, Ent. xxiv, Supp. p. 78, n. sp.  
*Dichelus subpilosus, latipes*, Cape, NONFRIED, p. 257, Deutsche e. Z. 1891, n. spp.

*Diphycerus reitteri*, Gan-ssu, SEMENOW, p. 328, Hor. Ent. Ross. xxv, n. sp.

*Ectinohoplia hüttenbacheri*, Himalaya, NONFRIED, p. 258, Deutsche e. Z. 1891, n. sp.

*Encya sikoræ, albostrata, pilosa*, Madagascar, BRENSKE, Soc. Ent. vi, p. 98, n. sp.

*Enthora ornata*, Madagascar, NONFRIED, p. 267, Deutsche e. Z. 1891, n. sp.

*Exopholis bremskei*, Nias I., NONFRIED, p. 263, Deutsche e. Z. 1891, n. sp.

*Haplonycha nitidicollis*, N. Australia, NONFRIED, p. 262, Deutsche e. Z. 1891, n. sp.

*Hecatomnus*, n. g., near *Rhizotrogus*, for *H. grandicornis*, n. sp., China; FAIRMAIRE, p. cci, C.R. Ent. Belg. xxxv.

*Hexatenius*, n. g., near *Rhizotrogus*, for *H. protensus*, n. sp., China; FAIRMAIRE, p. ix, C.R. Ent. Belg. xxxv.

*Hilyotrogus longiclavus*, Sze-chuen, BATES, Ent. xxiv, Supp. p. 74, n. sp.

*Holomelia*, n. g., p. 313, near *Holotrichia*, for *H. mirabilis*, n. sp., E. India, p. 314; BRENSKE, Ent. Nachr. xvii.

*Homalopia flavofusca*, Central Africa, KOLBE, p. 29, S. E. Z. 1891, n. sp.

*Hoplia pilifera*, Desb., = (*anatolica*, Reitt.); REITTER, p. 226, Wien. ent. Z. x.

*H. kobelti*, Algeria, REITTER, p. 33, Wien. ent. Z. x; *H. ornata*, Madagascar (?), *argentata*, Honduras, NONFRIED, p. 259, Deutsche e. Z. 1891; *H. concolor*, Kogyar, SHARP, p. 47, Col. Sec. Yark. Miss.; *H. polita*, E. India, BATES, Ent. xxiv, Supp. p. 14; *H. weisei*, Chinese Turkestan, SEMENOW, p. 327, Hor. Ent. Ross. xxv: n. spp.

*Hyperius castaneus*, Moupin, FAIRMAIRE, p. cxviii, C.R. Ent. Belg. xxxv, n. sp.

*Hypochrus*, n. g., near *Rhizotrogus*, for *H. brevicollis*, n. sp., China, FAIRMAIRE, p. cci, C.R. Ent. Belg. xxxv.

*Lachnosterna*: habits and larvæ of N. American species; FORBES, Rep. xvii, pp. 30-53, pl. iv: life-history; *id.* Ins. Life, iii, pp. 239-246: period of metamorphosis; RILEY, P. E. Soc. Wash. ii, pp. 132-134. *L. insperata* and *fraterna*, notes on; HAMILTON, Ent. News, ii, pp. 135-137.

*L. stridulans, pulvinosa*, p. 48, *stoliczkae*, p. 49, Murree, SHARP, Col. Sec. Yark. Miss.; *L. dubitabilis*, Kashmir, FAIRMAIRE, p. cxxiii, C.R. Ent. Belg. xxxv; *L. occipitalis*, p. 14, *batillaria, batillina, gradatifrons*,

p. 15, *nubiliventris*, p. 16, E. India, BATES, Ent. xxiv, Supp.; *L. subiridea*, China, FAIRMAIRE, p. cci, C.R. Ent. Belg. xxxv; *L. ochrogaster*, p. 74, *calliglypta*, *æquabilis*, p. 75, *protracta*, p. 76, Sze-chuen, BATES, Ent. xxiv, Supp.; *L. wittkugeli*, *elegans*, p. 264, *spaethi*, *gracilis*, p. 265, Honduras, NONFRIED, Deutsche e. Z. 1891 : n. spp.

*Lasiopsis*, *Asceptonycha*, and *Lachnota*: characters and synonymy discussed; BRENSKE, pp. 4-6, Ent. Nachr. xvii. *Lasiopsis* and *Monotropus*: nomenclature again discussed; *id.* pp. 316-319, *t. c.* *Lasiopsis* and *Lachnota*: validity of these names discussed; REITTER, pp. 107-109, Wien. ent. Z. x.

*Lepidiotia præcellens*, Sze-chuen, BATES, Ent. xxiv, Supp. p. 76, n. sp.

*Liogenis elegans*, Brazil, NONFRIED, p. 262, Deutsche e. Z. 1891, n. sp.

*Macroductylus subspinosus*: metamorphoses, &c., noticed, p. 257; figured, pl. v, figs. 1 & 2; RILEY, Rep. 1890.

*Macroductylus subspinosus*: metamorphoses; SMITH (826).

*Melolontha vulgaris*: duration of its subterranean period of existence; RASPAIL, Bull. Soc. Z. Fr. xvi, p. 271: subintestinal nerves; BINET (72). *M. insignis*, redescribed; FAIRMAIRE, p. lxxxix, C.R. Ent. Belg. xxxv.

*M. æneicollis*, E. India, BATES, Ent. xxiv, Supp. p. 16; *M. laticauda*, Sze-chuen, *id. t. c.* p. 77; *M. costata*, China, NONFRIED, p. 266, Deutsche e. Z. 1891; *M. sculpticollis*, China, FAIRMAIRE, p. x, C.R. Ent. Belg. xxxv : n. spp.

*Microphylla*, Kr.: note on its distinction from *Cyphonotus*; KRAATZ, p. 135, Wien. ent. Z. x; REITTER, *t. c.* p. 137.

*Monochelus vagans*, Centr. Africa, KOLBE, p. 28, S. E. Z. 1891, n. sp.

*Monotropus suworzewi*, Altai, SEMENOW, p. 319, Hor. Ent. Ross. xxv, n. sp.

† *Enochirus*, n. g., *Macrophyllinarum*, for *Æ. fulvescens*, n. sp., Centr. Africa: KOLBE, p. 32, S. E. Z. 1891.

*Pachydema gracilipes*, Transcaspian region, SEMENOW, p. 317, Hor. Ent. Ross. xxv, n. sp.

✓ *Pentelia*, n. g., for *Lachnosterna discedens*, Shp.; BRENSKE, p. 314, Ent. Nachr. xvii.

*Polyphylla*, *Anoxia* and *Cyphonotus*, characters and composition of, discussed; BRENSKE, Ent. Nachr. xvii, pp. 210-216. *Polyphylla*, *Cyphonotus*, &c.: notes on various species, with reference to the views of Brenske; KRAATZ, pp. 347-352, Deutsche e. Z. 1891.

*P. macrocera*, Cuenca, REITTER, p. 36, Deutsche e. Z. 1891, n. sp.

*Rhizotrogus*: notes on the silky Russian species; KRAATZ, pp. 355 & 356, Deutsche e. Z. 1891. *R. limbatipennis*, *ater*, &c.: synonymical note; KRAATZ, Ent. Nachr. xvii, p. 333; BRENSKE, *t. c.* p. 361. *R. furvus*, Germ., = (*limbatipennis*, Villa); KRAATZ, Ent. Nachr. xvii, p. 161, but cf. BRENSKE, *t. c.* p. 219. *R. vulpinus*, ♀ = (*Cyphonotus thoracicus*, Kryn.), KRAATZ, p. 353, Deutsche e. Z. 1891. *R. marginipes*: variation described; BRENSKE, Soc. Ent. v, p. 177.

*R. (Amphimallus) seidlitzii*, Escorial, BRENSKE, p. 57, Ent. Nachr. xvii ; *R. heydeni*, Amasia, p. 216, *schaufussi*, Brussa, *creticus*, Crete, p. 218, BRENSKE, Ent. Nachr. xvii ; *R. bilobus*, Yangihissar, SHARP, p. 49, Col. Sec. Yark. Miss. ; *R. diversifrons*, *trichophorus*, p. cxcix, *breviceps*, *cribellatus*, p. cc, China, FAIRMAIRE, C.R. Ent. Belg. xxxv ; *R. potanini*, Gan-ssu, SEMENOW, p. 318, Hor. Ent. Ross. xxv : n. spp.

*Schizonycha propinqua*, p. 24, *juncta*, p. 25, *hamata*, p. 33, Central Africa, KOLBE, S. E. Z. 1891, n. spp.

† *Selomothus*, n. g., near *Sebaris*, p. cclxxxv, for *S. diversiceps*, n. sp., E. Africa, p. cclxxxvi ; FAIRMAIRE, C.R. Ent. Belg. xxxv.

*Serica laticula*, Yarkand, SHARP, p. 47, Col. Sec. Yark. Miss. ; *S. ovatula*, *opacifrons*, p. cxcv, *impressicollis*, *nigromaculosa*, p. cxevi, *nigropicta*, p. cxevii, China, FAIRMAIRE, C.R. Ent. Belg. xxxv ; *S. uniformis*, Honduras, p. 260, *trochiloides*, Guinea, *elongata*, Honduras, p. 261, NONFRIED, Deutsche e. Z. 1891 : n. spp.

*Tanyproctus lutitarsis*, Taschkent, REITTER, p. 24, Deutsche e. Z. 1891, n. sp.

*Toxospathius auriventris*, Ta-tsien-lu, BATES, Ent. xxiv, Supp. p. 73, n. sp.

*Trochalus maculiscutum*, Gaboon, FAIRMAIRE, p. 238, Ann. Soc. Ent. Fr. 1891, n. sp.

### *Rutelini.*

*Adoretus nudiusculus*, p. 51, *simplex*, p. 52, Jhelam Valley, SHARP, Col. Sec. Yark. Miss. *A. vitiensis*, Fiji Is., NONFRIED, p. 268, Deutsche e. Z. 1891 : n. spp.

*Anomala rufopartita*, *rufozonula*, are the sexes of one species ; FAIRMAIRE, p. xi, C.R. Ent. Belg. xxxv.

*A. (Callistethus) stoliczkae*, Murree, SHARP, p. 50, Col. Sec. Yark. Miss. ; *A. euchroma*, p. cciv, *planerae*, p. ccv, China, FAIRMAIRE, C.R. Ent. Belg. xxxv ; *A. (Heteroplia) bruchypus*, *A. holomelana*, p. 17, *prasinicollis*, p. 18, E. India, BATES, Ent. xxiv, Supp. ; *A. straminea*, Sze-tschuan, p. 320, *oziana*, W. Bukhara, p. 321, SEMENOW, Hor. Ent. Ross. xxv ; *A. (Euchlora) coxalis*, p. 77, *millestriga*, p. 78, Sze-chuen, BATES, Ent. xxiv, Supp. ; *A. stigmaticollis*, p. 238, *pygialis*, p. 239, W. Africa, FAIRMAIRE, Ann. Soc. Ent. Fr. 1891 ; *A. trabeata*, E. Africa, FAIRMAIRE, p. cclxxxv, C.R. Ent. Belg. xxxv : n. spp.

*Aprosterna castaneipennis*, China, FAIRMAIRE, p. cciv, C.R. Ent. Belg. xxxv, n. sp.

*Euchlora monochroa*, E. India, BATES, Ent. xxiv, Supp. p. 18, n. sp.

† *Leucopelaea*, n. sp., near *Platyraelia*, for *L. albescens*, n. sp., Ecuador, BATES, p. 30, in Whympers Supp. App.

† *Malaia*, n. g., near *Popilia*, p. 298, for *M. ritsemæ*, Celebes, p. 301, *trajecta*, I. of Salayer, p. 302, *vandepolli*, Celebes, *simulatrix*, Bangkei, p. 303, n. spp., and *Popilia nigrata*, Boisd. ; HELLER, Deutsche e. Z. 1891.

*Mimela viriditincta*, China, FAIRMAIRE, p. ccv, C.R. Ent. Belg. xxxv ; *M. dulcissima*, Sze-chuen, BATES, Ent. xxiv, Supp. p. 78 : n. spp.

*Phyllopertha humeralis*, Asia Minor, KRAATZ, p. 124, Deutsche e. Z. 1891 (but cf. REITTER, Wien. ent. Z. x, p. 256, who says this is a *Phyllobrotica*) ; *P. reitteri*, Turkestan, SEMENOW, p. 324, Hor. Ent. Ross. xxv ; *P. atritarsis*, *incostata*, China, FAIRMAIRE, p. xi, C.R. Ent. Belg. xxxv ; *P. tenuelimbata*, China, FAIRMAIRE, p. cciii, C.R. Ent. Belg. xxxv : n. spp.

*Platycolia nigricauda*, Ecuador, BATES, in Whymper Supp. App. p. 30, n. sp.

*Plusiotis*, diagnoses of species of ; NONFRIED, pp. 301-306, Wien. ent. Z. x.

*P. karschi*, Honduras, NONFRIED, p. 306, Wien. ent. Z. x., n. sp.

*Popilia chrysitis*, Sze-chuen, BATES, Ent. xxiv, Supp. p. 79 ; *P. tagala*, Philippines, HELLER, p. 305, Deutsche e. Z. 1891 : n. spp.

† *Pseudosinghala*, n. g. (*Anomalariarum*), p. 294, for *P. vorstmanni*, Sumatra, p. 295, *birmana*, *rugosifrons*, Burma, p. 297, n. spp., including also *dalmanni*, Gyll., *transversa*, Burm. ; HELLER, Deutsche e. Z. 1891.

*Singhala hindu*, p. 291, *vidua*, p. 294, Ceylon, HELLER, Deutsche e. Z. 1891, n. spp.

*Spilota plagiicollis*, Fairm., var. = (*impicta*, Bates) ; BATES, Ent. xxiv, Supp. p. 78.

*Thyridium impunctatum*, Ecuador, BATES, in Whymper Supp. App. p. 29, n. sp.

### *Dynastini.*

† *Barotheus*, n. g., near *Cyclocephala*, p. 30, for *B. andinus*, n. sp., Ecuador, p. 31 ; BATES, in Whymper Supp. App.

† *Baryxenus*, n. g. (*Pimelopides*), p. 32, for *B. æquatorius*, n. sp., Ecuador, p. 33 ; BATES, in Whymper Supp. App.

√ *Cephusodotus*, n. g., near *Phyllognathus*, p. 239, for *C. rufocastaneus*, n. sp., W. Africa, p. 240 ; FAIRMAIRE, Ann. Soc. Ent. Fr. 1891.

*Cyclocephala rubescens*, Ecuador, BATES, in Whymper Supp. App. p. 31, n. sp.

*Dyscinetus dubius*, synonymy and variation noticed ; BATES, in Whymper Supp. App. p. 32.

*Heterogomphus whymperi*, Ecuador, BATES, in Whymper Supp. App. p. 33, n. sp.

*Heteronychus poropygus*, *annulatus*, E. India, BATES, p. 19, Ent. xxiv, Supp., n. spp.

*Lygirus bryanti*, Lower California, RIVERS, p. 97, P. Cal. Ac. Sci. (2) iii, n. sp.

*Parastasia vitiensis*, Fiji Is., NONFRIED, p. 267, Deutsche e. Z. 1891, n. sp.

*Pentodon truncatus*, p. 52, *pumilus*, p. 53, Kogyar, SHARP, Col. Sec. Yark. Miss., n. spp.

*Phileurus sublævis*, p. cxxiii, *binodulus*, *curtipennis*, p. cxxiv, Kashmir, FAIRMAIRE, C.R. Ent. Belg. xxxv, n. spp.

*Phyllognathus degener*, Senegal, FAIRMAIRE, p. 240, Ann. Soc. Ent. Fr. 1891, n. sp.

<sup>1</sup>*Praogolofa*, n. g., for *P. unicolor*, n. sp., Ecuador, BATES, in Whymper Supp. App. p. 34, n. sp.

*Temnorhynchus stormsi*, Lake Tanganyika, DUVIVIER, p. cccix, C.R. Ent. Belg. xxxv, n. sp.

### *Cetoniini.*

[Cf. BATES (34, 35, 963), DUVIVIER (221), FAIRMAIRE (254, 261), KOLBE (479), KRAATZ (486, 488, 489, 490), NONFRIED (624), POLL & KANNEGIETER (660), QUEDENFELDT (670), REITTER (693, 694), SEMENOW (797).]

Tables of the characters of the genera and species of the Palearctic fauna; REITTER, Deutsche e. Z. 1891, pp. 49-74.

*Anochiliu* (sub *Cetonia*) *bifida*, Ol., = (*republicana*, Coq.); KANNEGIETER, p. 196, Notes Leyd. Mus. xiii.

*Brachytricha aethiessina*, Bosdagh, REITTER, p. 74, Deutsche e. Z. 1891, n. sp.

*Cetonia impavida*, Jans., = (*dohrni*, Har.); BATES, p. 21, Ent. xxiv, Supp. *C. floricola*, n. var. *fausti*; KRAATZ, p. 75, Deutsche e. Z. 1891.

*C. viridescens*, Syria, REITTER, p. 53, Deutsche e. Z. 1891; *C. siamensis*, p. 269, *pretiosa*, p. 270, Siam, NONFRIED, Deutsche e. Z. 1891; *C. guilloti*, China, FAIRMAIRE, p. xii, C.R. Ent. Belg. xxxv : n. spp.

*Chalcothea fruhstorferi*, Java, KRAATZ, p. 315, Deutsche e. Z. 1891, n. sp.

*Gnorimidia toyæ*, Lansb., = (*Cirrhopila flavo-maculata*, Kr.); POLL, p. 188, Notes Leyd. Mus. xiii.

*Clinteria cerulea*, n. var. *megaspilota*, KANNEGIETER, p. 183, Notes Leyd. Mus. xiii. *C. pumila*, Swartz, redescribed as a distinct species; POLL, p. 184, t. c.

*Coryphocera elegans*, n. var. *fulgidissima*, KANNEGIETER, p. 182, Notes Leyd. Mus. xiii.

*Cremastochilus knochii*, habits; LUGGER, Ent. News, ii, p. 21.

*Dicranocephalus adamsi*, Pasc., = (*dabryi*, Auz.), distinctive characters; BATES, Ent. xxiv, Supp. p. 79.

*Diplognatha subænea*, Congo, DUVIVIER, C.R. Ent. Belg. xxxv, p. ccclxii, n. sp.

*Eudicella bertherandi*, Central Africa, FAIRMAIRE, p. 241, Ann. Soc. Ent. Fr. 1891, n. sp.

• *Glycetonia*, n. g., for *Glycyphana fulvistemma*, Motsch.; REITTER, pp. 50 & 52, Deutsche e. Z. 1891.

*Glycyphana minima*, E. India, BATES, p. 21, Ent. xxiv, Supp., n. sp.

*Goliathus melaleucus*, figured, pl. v, fig. 4, Ann. Soc. Ent. Fr. 1891.

*Goniochilus meyeri*, Central Africa, KOLBE, p. 29, S. E. Z. 1891, n. sp.

*Gnorimus anoguttatus*, China, FAIRMAIRE, p. xiii, C.R. Ent. Belg. xxxv, n. sp.

*Gymnetis flavocincta*, Ecuador, BATES, in Whymper Supp. App. p. 34;

*G. auropecta*, Honduras, NONFRIED, p. 269, Deutsche e. Z. 1891 : n. spp.

*Leucocelis (Oxythyrea) tripolitana*, Tripolis, REITTER, p. 25, Deutsche e. Z. 1891, n. sp. ♀

*Lomaptera duboulayi*, Th., = (*marginata*, Kr.); POLL, p. 188, Notes Leyd. Mus. xiii.

*Macronota egregia* and *biplagiata*, Gory, notes on, with new names of varieties; KRAATZ, pp. 253 & 254, Deutsche e. Z. 1891.

*M. fulvoguttata*, China, FAIRMAIRE, p. xi, C.R. Ent. Belg. xxxv, n. sp.

*Melinsthes soror*, S. Africa, KRAATZ, p. 130, Deutsche e. Z. 1891, n. sp.

✓ *Pachnotosia*, n. subg. of *Potosia*, p. 56, for *P. ganglbaueri*, n. sp., North Persia, p. 57, including also *Cetonia brevitarsis*, Lewis; REITTER, Deutsche e. Z. 1891.

*Pilinopyga nigra*, Congo, DUVIVIER, p. ccclxii, C.R. Ent. Belg. xxxv, n. sp.

*Plasiorrhina scalaris*, E. Africa, QUEDENFELDT, p. 168, B. E. Z. xxxvi, n. sp.

*Potosia (Melanosa) ithæ*, Greece, REITTER, p. 66, Deutsche e. Z. 1891, n. sp.

✓ *Prælinotarsia*, n. g. (*Schizorhinides*), p. ccclxii, for *P. limbaticpennis*, n. sp., Congo, p. ccclxiii, DUVIVIER, C.R. Ent. Belg. xxxvi.

*Rhomborhina rufitibiis*, Sze-chuen, BATES, Ent. xxiv, Supp. p. 79, n. sp.

*Smaragdesthes subsuturalis*, Congo, KRAATZ, p. 123, Deutsche e. Z. 1891, n. sp.

*Sphyrorrhina charon*, noticed, BORN, Soc. Ent. v, p. 163.

*Stalagmosoma* and *Stalagmopygus*, characters discussed; KRAATZ, Deutsche e. Z. 1891, pp. 316-318.

*Stethodesma*: note on the African species, sexual characters, and synonymy; KRAATZ, Deutsche e. Z. 1891, p. 127.

*Taniodera moupinensis*, China, FAIRMAIRE, p. xii, C.R. Ent. Belg. xxxv, n. sp.

*Thaumastopeus ceylonicus*, Colombo, POLL, p. 185, Notes Leyd. Mus. xiii, n. sp.

*Tmesorrhina concolor*, Westw., and allies, note on; KRAATZ, pp. 128 & 129, Deutsche e. Z. 1891.

*T. tridens*, Congo, DUVIVIER, p. ccclxi, C.R. Ent. Belg. xxxv, n. sp.

*Trichius rosaceus*, variation, pp. 193-195, *gallicus*, varieties, p. 196, *fasciatus*, varieties, pp. 197 & 198, discussed; KRAATZ, Deutsche e. Z. 1891.

*Trigonophorus rothschildii*, China, FAIRMAIRE, p. ccvi, C.R. Ent. Belg. xxxv, n. sp.

*Valgus heydeni*, Sze-tschuan, SEMENOW, p. 331, Hor. Ent. Ross. xxv; *V. parvicollis*, China, FAIRMAIRE, p. ccvi, C.R. Ent. Belg. xxxv: n. spp.

## BUPRESTIDÆ.

[Cf. ABEILLE (3), BLACKBURN (74, 75), COTES (162), DUGÈS (218), FAIRMAIRE (254, 256, 259, 260), FAUVEL (275), HELLER (379, 381), HORN (404, 405), JAKOWLEFF (438), KERREMANS (462, 463), NONFRIED (624, 626), REITTER (697), SEMENOW (797).]

Characters of *Buprestidæ* of New Caledonia; FAUVEL, pp. 173-182, Rev. d'Ent. x.

Structure of the metasternum as distinction of the family ; BLANCHARD, *Psyche*, vi, p. 53.

*Acmaeodera* 18-*punctata* and 18-*guttata*, characters of, p. 270, *biseriata*, n. var. *simulans*, p. 272, *spilophora*, n. var. *stellata*, p. 273, *reichei*, characters of, p. 274, *taniata*, variation described, pp. 278 & 279, *despecta*, = (*reflexungula*, Reitt.), p. 280 ; ABEILLE, Rev. d'Ent. x.

*A.* 4-*zonata*, Turkey and Syria, p. 269, 16-*mactata*, p. 272, *undulata*, p. 274, *ocellata*, p. 275, Syria, *truquii*, Cyprus, p. 275, *macchabæa*, Syria, p. 276, *guillebeaudi*, Cyprus, p. 277, *albifrons*, Caucasus, p. 278, *impunctata*, Syria, *senex*, Greece, p. 279, ABEILLE, Rev. d'Ent. x ; *A. soror*, E. Africa, FAIRMAIRE, p. ccxc, C.R. Ent. Belg. xxxv ; *A. chotanica*, Chinese Turkestan, SEMENOW, p. 338, Hor. Ent. Ross. xxv ; *A. mæsta*, p. 11, *jucunda*, *sinaloensis*, p. 14, Mexico, DUGÈS, Nat. Mex. ii : n. spp.

*Actenodes mendax*, Texas, HORN, p. 46, Tr. Am. Ent. Soc. xviii, n. sp.

*Agrilus* : monograph of the N. American species ; HORN, Tr. Am. Ent. Soc. xviii, pp. 277-336, pl. viii.

*A. validiusculus*, p. 341, *ganglbaueri*, p. 344, Transcaspian region, *caucasicola*, p. 341, *amethystopterus*, *laticeps*, p. 342, Caucasus, SEMENOW, Hor. Ent. Ross. xxv ; *A. chrysoderes*, p. 283, *foliicornis*, *tenuissimus*, p. 284, Syria, ABEILLE, Rev. d'Ent. x ; *A. cycloderus*, Gaboon, FAIRMAIRE, p. 244, Ann. Soc. Ent. Fr. 1891 ; *A. frenchi*, Victoria, BLACKBURN, p. 302, Tr. R. Soc. S. Austr. xiv ; *A. obtusus*, p. 288, *crinicornis*, p. 294, *masculinus*, p. 295, *angelicus*, p. 298, *audax*, p. 300, *nevadensis*, p. 303, *niveiventris*, p. 304, *pensus*, *blanchardi*, p. 305, *concinus*, p. 310, *jacobinus*, p. 314, *scitulus*, p. 318, *ornatulus*, p. 319, *ventralis*, p. 320, *blandus*, *abjectus*, p. 321, *abstersus*, p. 324, *abductus*, p. 325, *palmaecollis*, *felix*, p. 326, *impevus*, p. 327, *abditus*, p. 332, N. America, HORN, Tr. Am. Ent. Soc. xviii ; *A. albofasciatus*, p. 23, *deborrei*, *sallei*, p. 24, *metallesceus*, *parvus*, *bimaculatus*, p. 26, *fossulatus*, *sexmaculatus*, p. 27, *rubrovittatus*, p. 28, *caliginosus*, *igneosignatus*, p. 29, *cupreomaculatus*, p. 30, *fraternus*, *tupurensis*, p. 31, *consobrinus*, *kerremansi*, *purpureus*, p. 32, *tarrascus*, *alemani*, *nanus*, p. 33, *carmineus*, *novus*, p. 34, *chlorus*, p. 35, Mexico, DUGÈS, Nat. Mex. ii : n. spp.

*Ancylocheria ledereri*, *dauidis* : variation described ; ABEILLE, pp. 259 & 260, Rev. d'Ent. x.

*A. costipennis*, Kashmir, FAIRMAIRE, p. cxxvi, C.R. Ent. Belg. xxxv, n. sp.

*Anilara subcostata*, S. Australia, *soror*, Queensland, *angusta*, Victoria, p. 296, *læta*, S. Australia, p. 297, BLACKBURN, Tr. R. Soc. S. Austr. xiv, n. spp.

*Anthaxia bonvouloiri*, characters of, p. 261, *bicolor*, n. varr. *togata*, *myrmidon*, p. 264, *plicata* and *marmottani*, characters of, p. 264, *helvetica* and allies, characters of, p. 265 ; ABEILLE, Rev. d'Ent. x. *A. ephippiata*, Redt., = (*editheæ*, Reitt.) ; REITTER, p. 226, Wien. ent. Z. x.

*A. platysoma*, p. 261, *purpureus*, p. 262, *rutilipennis*, p. 263, *sericea*, Algeria, p. 286, ABEILLE, Rev. d'Ent. x ; *A. conradti*, Turkestan, p. 335, *flammifrons*, Chinese Turkestan, p. 337, SEMENOW, Hor. Ent. Ross. xxv ;



*A. cordicollis*, p. 179, *excavata*, p. 180, New Caledonia, FAUVEL, Rev. d'Ent. x : n. spp.

*Blepharum bivittatum*, New Caledonia, KERREMANS, p. clx, C.R. Ent. Belg. xxxv, n. sp.

*Brachys chapuisi, hexagonalis*, Mexico, DUGÈS, p. 36, Nat. Mex. ii, n. spp.

*Bubastes inconsistans*, Th., = (*inconstans*, Blk.); BLACKBURN, p. 788, P. Linn. Soc. N.S.W. (2) v. *B. globicollis*, Th., = (*laticollis*, Blk.); BLACKBURN, p. 294, Tr. R. Soc. S. Austr. xiv.

*B. occidentalis*, W. Australia, p. 293, *splendens*, Centr. Australia, p. 294, BLACKBURN, Tr. R. Soc. S. Austr. xiv : n. spp.

*Buprestis jimenezi*, Mexico, DUGÈS, Nat. Mex. ii, p. 7, n. sp.

*Capnodis tenebricosa*, n. var., *aurosparsa*; ABEILLE, p. 258, Rev. d'Ent. x.

*Capnodis vermiculata, kashmirensis*, Kashmir, FAIRMAIRE, p. cxxv, C.R. Ent. Belg. xxxv; *C. bactriana*, S. Turkestan, SEMENOW, p. 334, Hor. Ent. Ross. xxv : n. spp.

*Castalia*: the species discussed and reduced to two; HELLER, pp. 135-143, Deutsche e. Z. 1892.

*Chalcogenia suturalis*, Abyssinia, KERREMANS, p. clxi, C.R. Ent. Belg. xxxv, n. sp.

*Chalcophora telekyi*, E. Africa, FAIRMAIRE, p. cclxxxviii, C.R. Ent. Belg. xxxv; *C. frenchi*, Queensland, BLACKBURN, Tr. R. Soc. S. Austr. xiv : n. spp.

*Chalcotenia cerata*, S. Australia, KERREMANS, p. clix, C.R. Ent. Belg. xxxv, n. sp.

*Chrysobothris abyssinica*, Abyssinia, *leviscutata*, Senegal, FAIRMAIRE, p. 243, Ann. Soc. Ent. Fr. 1891; *C. andamana*, Andaman Is., KERREMANS, p. clxii, C.R. Ent. Belg. xxxv; *C. jakolewi*, Transcasian region, SEMENOW, p. 340, Hor. Ent. Ross. xxv; *C. sobrina, armata*, p. 19, *ignota*, p. 20, Mexico, DUGÈS, Nat. Mex. ii : n. spp.

*Chrysochroa* and allied genera, characters tabulated; KERREMANS, p. cccviii, C.R. Ent. Belg. xxxv.

*C. tenuicauda*, Philippines, KERREMANS, p. clvi, C.R. Ent. Belg. xxxv, n. sp.

*Chrysodema erythrocephala*, Mont., variation, = (*suturalis, mæsta*, Saund., *montrousieri*, Th.); FAUVEL, p. 174, Rev. d'Ent. x.

*C. splendens*, Cameroons, NONFRIED, p. 271, Deutsche e. Z. 1891; *C. deplanchei*, New Caledonia, FAUVEL, p. 175, Rev. d'Ent. x : n. spp.

*Cisseis dispar*, p. 297, *bella*, p. 298, *pygmaea, verna*, p. 299, Victoria, *perplexa*, S. Australia, p. 300, BLACKBURN, Tr. R. Soc. S. Austr. xiv; *C. sennotata*, New Caledonia, FAUVEL, p. 181, Rev. d'Ent. x : n. spp.

*Conognathia kerremansi*, Brazil, NONFRIED, p. 272, Deutsche e. Z. 1891, n. sp.

*Coræbus amethystinus*, metamorphoses; XAMBEU, Le Nat. 1891, p. 282.

*C. carinifer*, Syria, p. 280, *cupulariæ*, Mediterranean region, p. 282, ABEILLE, Rev. d'Ent. x; *C. quadrispinosus*, China, FAIRMAIRE, p. ccvii, C.R. Ent. Belg. xxxv; *C. pilosicollis*, Queensland, BLACKBURN, p. 301, Tr. R. Soc. S. Austr. xiv : n. spp.

*Cylindromorphus parallelus* and *gallicus*, characters of ; *parallelus*, = (*strigatulus*, Rey) ; ABEILLE, p. 285, Rev. d'Ent. x.

*Cyphosoma lancifera*, Smyrna, ABEILLE, p. 258, Rev. d'Ent. x, n. sp.

*Dicerca anea*, n. var. *bella* ; ABEILLE, p. 259, Rev. d'Ent. x.

*Discoderes subcornutus*, Gaboon, FAIRMAIRE, p. 244, Ann. Soc. Ent. Fr. 1891, n. sp.

*Dystaxia murrayi*, Lec., = (*lecontei*, Th.) ; HORN, Tr. Am. Ent. Soc. xviii.

*Euphorticus occidentalis*, California, HORN, p. 38, Tr. Am. Ent. Soc. xviii, n. sp.

*Evides kerremansi*, Guinea, FAIRMAIRE, p. 242, Ann. Soc. Ent. Fr. 1891, n. sp.

*Evimantius*, Deyr., characters and systematic position ; KERREMANS, p. clxiii, C.R. Ent. Belg. xxxv.

*E. rufopictus*, p. clxiii, *curvicollis*, p. clxiv, Madagascar, KERREMANS, t. c., n. spp.

*Iridotenia mahena*, Seychelles, FAIRMAIRE, p. xlv, Bull. Soc. Ent. Fr. 1892, n. sp.

*Julodis höhnelii*, *semiimpressa*, E. Africa, FAIRMAIRE, p. cclxxxvii, C.R. Ent. Belg. xxxv, n. spp.

*Melanophila delagrangei*, Syria, ABEILLE, p. 268, Rev. d'Ent. x ; *M. nigra*, Mexico, DUGÈS, p. 8, Nat. Mex. ii : n. spp.

*Melobasis pulchra*, Central Australia, p. 294, *bicolor*, W. Australia, p. 295, BLACKBURN, Tr. R. Soc. S. Austr. xiv ; *M. scutata*, p. 171, *viridipes*, *auribasis*, p. 178, *paitana*, p. 179, New Caledonia, FAUVEL, Rev. d'Ent. x : n. spp.

√ *Microcastalia*, n. g., for *Castalia globithorax*, Thoms. ; HELLER, p. 143, Deutsche e. Z. 1891.

*Paracephala anea*, N.W. Australia, BLACKBURN, p. 302, Tr. R. Soc. S. Austr. xiv, n. sp.

*Phospheres chrysocomus*, New Caledonia, FAUVEL, p. 175, Rev. d'Ent. x, n. sp.

*Pæcilonota cyanipes* = (*debilis*, Lec.) ; HORN, p. 45, Tr. Am. Ent. Soc. xviii.

*Polycesta ægyptiaca*, Gm., to be called *depressa*, Fab. ; BEDEL, p. 153, L'Ab. xxvii.

*P. elata*, larva and pupa described ; ANGELL, Ent. News, ii, p. 106.

*Polyctesis igorrotta*, Philippines, HELLER, p. 159, Notes Leyd. Mus. xiii, n. sp.

*Pseudochrysodema aruensis*, Aru I., KERREMANS, p. clix, C.R. Ent. Belg. xxxv, n. sp.

*Psiloptera subcatenulata*, Th., redescribed and figured as *P. sulcicollis* ; FAIRMAIRE, p. 242, pl. v, fig. 8, Ann. Soc. Ent. Fr. 1891. *P. chlorana*, Lap., variation noticed, *pisana*, n. var. *gallica*, with description of sexual characters ; ABEILLE, p. 257, Rev. d'Ent. x. *P. drummondi*, habits ; MARLATT, P. E. Soc. Wash. ii, p. 43.

*P. (Aurigena) transcaspica*, Transcaspiian region ; SEMENOW, p. 332, Hor. Ent. Ross. xxv ; *P. lateoculata*, p. cclxxxviii, *oxyopia*, *pubifrons*, p. cclxxxix, E. Africa, FAIRMAIRE, C.R. Ent. Belg. xxxv ; *P. aureo-micans*, Haiti, NONFRIED, p. 272, Deutsche e. Z. 1891 : n. spp.

*Ptosima cyclops* and *flavoguttata*, variation of ; ABEILLE, p. 268, Rev. d'Ent. x.

*Schizopus latus*, sexual distinctions, p. 45, *sallei*, specific characters, p. 46 ; HORN, Tr. Am. Ent. Soc. xviii.

*Sphenoptera pharao*, variation described ; ABEILLE, p. 266, Rev. d'Ent. x.

*S. jewluchensis*, Reitt., = (*reitteri*, Jak.) ; REITTER, p. 257, Wien. ent. Z. x.

*S. pruinosa*, Russia mer, *viridiceps*, Syria, ABEILLE, p. 267, Rev. d'Ent. x ; *S. aethiops*, Amasia, p. 129, *obscura*, Turcomania, p. 130, *dilatipes*, Caucasus, p. 131, *koenigi*, Turcomania, p. 133, *lederi*, Syria, p. 134, *obsoleta*, Transcaucasus, p. 136, *unidentata*, Turkestan, p. 137, *S. (Chrysoblemma) caucasica*, p. 138, *S. (Oplistura) reitteri*, Transcaucasus, p. 139, JAKOWLEFF, Hor. Ent. Ross. xxv ; *S. antoniae*, Ordubad, REITTER, p. 142, Wien. ent. Z. x ; *S. sulcifrons*, Kashmir, FAIRMAIRE, p. cxxvi, C.R. Ent. Belg. xxxv ; *S. gossypii*, E. India, COTES, p. 33, Ind. Mus. Notes, ii : n. spp.

*Steraspis armata*, Ogowé, KERREMANS, p. cccix, C.R. Ent. Belg. xxxv ; *S. intermedia*, Zanzibar, p. clvii, *cambieri*, Usagara, p. clviii, KERREMANS, C.R. Ent. Belg. xxxv : n. spp.

*Sternocera castanea*, *syriaca*, eggs described ; ABEILLE, p. 257, Rev. d'Ent. x.

*S. kustai*, Yemen, NONFRIED, p. 335, Deutsche e. Z. 1891, n. sp.

*Stigmodera tibialis*, Wat., note on, p. 137, *S. murrayi*, Gemm., = (*imperator*, Th.), p. 139 ; BLACKBURN, Tr. R. Soc. S. Austr. xiv. *S. frenchi*, Blk., and *præcellens*, Ker., are one species ; BLACKBURN, p. 789, P. Linn. Soc. N.S.W. (2) v.

*S. princeps*, p. 137, *rectipennis*, p. 138, W. Australia, BLACKBURN, Tr. R. Soc. S. Austr. xiv, n. spp.

*Taphrocerus leoni*, *kerremansi*, Mexico, DUGÈS, p. 35, Nat. Mex. ii, n. spp.

*Trachys compressa*, Vaucluse, ABEILLE, p. 286, Rev. d'Ent. x, n. sp.

#### THROSCIDÆ and EUCNEMIDÆ.

[Cf. HART (374), HORN (404), SEMENOW (797).]

*Throscidæ* and *Buprestidæ*, distinctive character ; HORN, p. 46, Tr. Am. Ent. Soc. xviii.

*Dromæolus morawitzi*, Transcaspiian region, SEMENOW, p. 346, Hor. Ent. Ross. xxv, n. sp.

*Galbella harti*, Dead Sea, JANSON, in Hart Fauna and Flora of Sinai, p. 184, pl., fig. 1, n. sp.

\**Palæoxenus*, n. g., for *Cryptostoma dohrnii* ; HORN, p. 40, Tr. Am. Ent. Soc. xviii.

*Microrhagus*, note on sexual distinctions ; HORN, p. 39, Tr. Am. Ent. Soc. xviii.

*Stethon errans*, referred to *Pæcilochrus*; HORN, p. 38, Tr. Am. Ent. Soc. xviii.

*Tharops potanini*, Gan-ssu, SEMENOW, p. 345, Hor. Ent. Ross. xxv, n. sp.

## ELATERIDÆ.

[*Cf.* BERGROTH (56), BERTKAU (60), BUYSSON (122, 123), CANDÈZE (131, 132), COMSTOCK & SLINGERLAND (154), DUVIVIER (221), FAIRMAIRE (254, 257, 259, 260), FLEUTIAUX (283, 284, 285), GORHAM (963), HORN (403), REITTER (694, 696, 701), SCHWARZ (781, 782, 783), SEMENOW (797).]

Supplement to the Catalogue of Candèze; BERGROTH, pp. cccxxiii-ccxxxvii, C.R. Ent. Belg. xxxv.

*Adelocera delagrangiei*, Syria, BUYSSON, p. cccxxviii, Bull. Soc. Ent. Fr. 1891, n. sp.

*Æolus*: table of character of the European and Russian species; REITTER, pp. 145-148, Wien. ent. Z. x: translation into French of Reitter's table of the European species; BEDEL, L'Ab. xxvii, pp. 157-160.

*Æ. fulvescens*, Ordubad, p. 145, *imitator*, Tunis, *candèzei*, p. 146, *bicarinatus*, p. 147, Turkestan, REITTER, Wien. ent. Z. x; *Æ. variabilis*, p. 279, *tresignatus*, *simoni*, *flavus*, p. 270, Venezuela, FLEUTIAUX, Ann. Soc. Ent. Fr. 1891: n. spp.

*Agonischius tenuatus*, Java, CANDÈZE, p. 246, Notes Leyd. Mus. xiii, n. sp.

*Agriotes*: tables of the characters of the palaearctic species, with figures of the male organs; SCHWARZ, Deutsche e. Z. 1891, pp. 81-114. *A. lineatus*, metamorphoses; LAMPA, Ent. Tidskr. xii, pp. 55-61. *A. mancus*, larva described; COMSTOCK & SLINGERLAND (154), pp. 251-258.

*A. heydeni*, *kraatzii*, p. 85, *conspicuus*, Asia Minor, *ganglbaueri*, p. 86, *prætermisus*, p. 87, Syria, *informis*, locality unknown, *starcki*, Caucasus, p. 94, *koltzei*, Wladiwostock, p. 99, *reitteri*, Caucasus, p. 101, *squalidus*, Siberia, *brevicollis*, Siberia, p. 104, *tristis*, Turkey, p. 105, *connexivus*, Marocco, *æqualis*, Sicily, p. 107, *incognitus*, Spain, p. 110, *hipponensis*, Algeria, p. 111, *sericatus*, *rugipennis*, Pekin, p. 113, SCHWARZ, Deutsche e. Z. 1891, n. spp.

*Agrypnus insularis*, Seychelles, FAIRMAIRE, p. lxx, Bull. Soc. Ent. Fr. 1891, n. sp.

*Alaus rochebrunei*, Senegal, FAIRMAIRE, p. 245, Ann. Soc. Ent. Fr. 1891; *A. intermedius*, Congo, DUVIVIER, p. cccxcix, C.R. Ent. Belg. xxxv: n. spp.

*Anoplischius cattleyæ*, Venezuela, FLEUTIAUX, p. 276, Ann. Soc. Ent. Fr. 1891, n. sp.

*Anthracaalaus pusteuri*, Nias I., CANDÈZE, p. 244, Notes Leyd. Mus. xiii, n. sp.

✓ *Anthracoptyx*, n. g., p. 30, for *A. hiemalis*, n. sp., Colorado, p. 31; HORN, Tr. Am. Ent. Soc. xxxiv.

*Asaphes decoloratus*, larva described ; COMSTOCK & SLINGERLAND, (154) pp. 258-262.

*Athoüs transcaucasicus*, Stierl., is the same as *Megapenthes carinifrons*, Desb., described as *Agriotes* ; REITTER, p. 227, Wien. ent. Z. x. *A. subtruncatus*, Muls., = (*crenatostratus*, Reiche, and *virgatus*, Reiche), *vittatus*, Fab., var. = (*conicicollis*, Desb.) ; BUYSSON, pp. cii & ciii, Bull. Soc. Ent. Fr. 1891.

*A. dispar*, Ecuador, GORHAM, in Whympers Supp. App. p. 44, n. sp.

*Atractosomus colombicus*, Venezuela, FLEUTIAUX, Ann. Soc. Ent. Fr. 1891, p. 277, n. sp.

*Cardiophorus olgæ*, ♂ described ; REITTER, p. 226, Wien. ent. Z. x. *C. argiolus* and *ulcerosus*, note on ; BUYSSON, p. clxxii, Bull. Soc. Ent. Fr. 1891.

*C. quadrinævus*, Ordubad, REITTER, p. 25, Deutsche e. Z. 1891 ; *C. reitteri*, Syria, SCHWARZ, p. 151, Deutsche e. Z. 1891 ; *C. nigratissimus*, *turgescens*, Syria, BUYSSON, p. cxxxix, Bull. Soc. Ent. Fr. 1891 ; *C. letourneuzi*, Upper Egypt, BUYSSON, p. lxxviii, Bull. Soc. Ent. Fr. 1891 ; *C. gramineus*, Java, CANDÈZE, Notes Leyd. Mus. xiii, p. 245 : n. spp.

*Cryptohypnus* : revision and classification of the N. American species, with discussion on the divisions of the genus ; HORN, Tr. Am. Ent. Soc. xviii, pp. 1, &c. *C. abbreviatus*, larva described ; COMSTOCK & SLINGERLAND, (154) pp. 270-272. *C. dermestoides* and allies, differential characters ; HORN, Ent. M. M. (2) ii, p. 72.

*C. delumbis*, p. 14, *cucullatus*, p. 17, *melsheimeri*, p. 19, *caurinus*, *dispersus*, p. 20, *gradarius*, p. 21, N. America, HORN, Tr. Am. Ent. Soc. xviii, n. spp.

*Diacanthus sulcatus*, Cand., note on ; KRAATZ, p. 126, Deutsche e. Z. 1891.

*D. ampliatus*, *semiaurantiacus*, p. cxxvii, *picticollis*, p. cxxviii, Kashmir, FAIRMAIRE, C.R. Ent. Belg. xxxv, n. spp.

*Dicronychus foveifrons*, E. Africa, FAIRMAIRE, p. ccxc, C.R. Ent. Belg. xxxv, n. sp.

*Drasterius elegans*, larva described ; COMSTOCK & SLINGERLAND, (154) pp. 267-270.

*Elater æthiops*, n. var. *turanus* ; SEMENOW, p. 349, Hor. Ent. Ross. xxv.

*E. ocellatus*, p. cxli, *lubricus*, p. cxli, Syria, BUYSSON, Bull. Soc. Ent. Fr. 1891 ; *E. reitteri*, S. Turkestan, *koenigi*, *hirticollis*, Caucasus, p. 348, *jakovlevi*, E. Siberia, p. 350. SEMENOW, Hor. Ent. Ross. xxv ; *E. fulvus*, Tashkent, *melanotoides*, Ordubad, REITTER, p. 234, Wien. ent. Z. x ; *E. fauneli*, New Caledonia, FLEUTIAUX, p. 388, Ann. Soc. Ent. Fr. 1891 : n. spp.

*Esthesopus candezi*, *amplicollis*, p. 285, *minutus*, p. 286, Venezuela, FLEUTIAUX, Ann. Soc. Ent. Fr. 1891, n. spp.

✓ *Globothorax*, n. g., near *Coptostethus*, p. cccxxii, for *G. chevrolati*, n. sp., Brazil, p. cccxxiii ; FLEUTIAUX, C.R. Ent. Belg. xxxv.

*Heterocrepidius* ? *simoni*, *estebanus*, Venezuela, FLEUTIAUX, p. 276, Ann. Soc. Ent. Fr. 1891, n. spp.

*Homaligus suturalis*, larva and ♀ described and figured ; BERTKAU, pp. 37-42, pl. iii, figs. 1-10, Deutsche e. Z. 1891.

*Horistonotus farinosus*, Gran Chaco, CANDÈZE, Mém. Soc. Zool. iv, p. 500, pl. iv, figs. 2 & 3 ; *H. simoni*, *vittatus*, p. 281, *quadrinotatus*, p. 285, Venezuela, FLEUTIAUX, Ann. Soc. Ent. Fr. 1891 : n. spp.

*Ischnodes languidus*, *picipus*, Smyrna, BUYSSON, p. cxlii, Bull. Soc. Ent. Fr. 1891, n. spp.

*Lacon quadri-picturatus*, Madagascar, SCHWARZ, p. 151, Deutsche e. Z. 1891 ; *L. angulicollis*, Java, *feralis*, Sumatra, CANDÈZE, p. 243, Notes Leyd. Mus. xiii : n. spp.

*Limonius turdus*, Cand., note on ; REITTER, p. 227, Wien. ent. Z. x.

*L. elegans*, Syria, BUYSSON, p. cxxxvii, Bull. Soc. Ent. Fr. 1891, n. sp.

† *Ludioschema*, n. g., near *Sericus*, p. 238, for *L. emerichi*, n. sp., Caucasus, p. 239 ; REITTER, Wien. ent. Z. x.

*Ludius amulus*, Java, CANDÈZE, p. 246, Notes Leyd. Mus. xiii, n. sp.

*Macromalocera caledonica*, New Caledonia, FLEUTIAUX, p. 395, Ann. Soc. Ent. Fr. 1891, n. sp.

*Megapenthes limbalis*, ♀ = (*granulosus*, Melsh.) ; LINELL, P. E. Soc. Wash. ii, p. 37.

*M. sexmaculatus*, p. 244, *sericeus*, p. 245, Sumatra, CANDÈZE, Notes Leyd. Mus. xiii ; *M. tricarinatus*, p. 389, *caledonicus*, p. 390, New Caledonia, FLEUTIAUX, Ann. Soc. Ent. Fr. 1889 : n. spp.

*Melanotus communis*, larva described ; COMSTOCK & SLINGERSLAND, (154) pp. 262-267.

*M. heydeni*, Margelan, *armeniacus*, Armenia, *punctatostratus*, Syria, p. 365, *ferrugineus*, Greece, *validus*, Margelan, p. 366, SCHWARZ, Deutsche e. Z. 1891 ; *M. conicicollis*, p. 235, *dilatocollis*, p. 236, Taschkent, *acuminatus*, Margelan, *fulvus*, Turkestan, p. 237, *atricapillus*, Ordubad, p. 238, REITTER, Wien. ent. Z. x : n. spp.

*Monocrepidius caracasanus*, p. 277, *numerosus*, *proximus*, p. 278, *incommodus*, p. 279, Venezuela, FLEUTIAUX, Ann. Soc. Ent. Fr. 1891 ; *M. limbithorax*, New Caledonia, FLEUTIAUX, p. 388, Ann. Soc. Ent. Fr. 1891 : n. spp.

*Negastrius pulchellus* and *sabulicola*, note on ; BUYSSON, p. clxxi, Bull. Soc. Ent. Fr. 1891.

*Nycterolampus*, n. g., near *Ochosternus*, p. 391, for *N. velutinus*, n. sp., New Caledonia, p. 393, including also *lifuanus*, Montr., and *Ochosternus gigas*, Cand. ; FLEUTIAUX, Ann. Soc. Ent. Fr. 1891.

*Ochosternus montrouzieri*, *dubius*, *punctiger*, *canalensis*, p. 394, *caledonicus*, p. 395, New Caledonia, FLEUTIAUX, Ann. Soc. Ent. Fr. 1891, n. spp.

*Oedostethus*, Lec., generic characters, note, and figure ; HORN, p. 30, pl. i, fig. 8, Tr. Am. Ent. Soc. xviii.

*Penia dubia*, Java, CANDÈZE, p. 246, Notes Leyd. Mus. xiii, n. sp.

*Plastocerus schaumii*, pupa described ; BLAISDELL, Ent. News, ii, p. 112.

*Pomatochilus colombicus*, p. 282, *minutissimus*, p. 283, Venezuela, FLEUTIAUX, Ann. Soc. Ent. Fr. 1891, n. spp.

*Prosternon (Corymbites) syriacus*, Syria, BUYSSON, p. cxxxvii, Bull. Soc. Ent. Fr. 1891, n. sp.

*Psephus itimbirensis*, W. Africa, DUVIVIER, p. ccccxix, C.R. Ent. Belg. xxxv; *P. rugulipennis*, E. Africa, FAIRMAIRE, p. ccxc, C.R. Ent. Belg. xxxv : n. spp.

*Pyrophorus ortizi*, Gran Chaco, CANDÈZE, Mém. Soc. Zool. Fr. iv, p. 500, pl. iv, fig. 1; *P. rotundicollis*, p. 390, *caledonicus*, p. 391, New Caledonia, FLEUTIAUX, Ann. Soc. Ent. Fr. 1891 : n. spp.

*Trichophorus schaumii*, note on; KRAATZ, p. 125, Deutsche e. Z. 1891.

*Triplonychus steinheili, dubius*, Venezuela, FLEUTIAUX, p. 283, Ann. Soc. Ent. Fr. 1891, n. spp.

### RHIPIDOCERIDÆ, DASCILLIDÆ.

[Cf. BOURGEOIS (84, 85), FAIRMAIRE (261), RIVERS (737).]

*Callirhipis philiberti*, Seychelles, FAIRMAIRE, p. lxx, Bull. Soc. Ent. Fr. 1891, n. sp.

*Dasyllus davidsoni*, larva and habits described; RIVERS, P. Cal. Ac. (2) iii, p. 93.

*D. præstans*, China, FAIRMAIRE, p. xiv, C.R. Ent. Belg. xxxv; *D. renardi*, Bengal, BOURGEOIS, p. cxxxvii, C.R. Ent. Belg. xxxv : n. spp.

*Lichas giganteus*, p. cxxviii, *trapezicollis*, p. cxxix, Kashmir, FAIRMAIRE, C.R. Ent. Belg. xxxv; *L. phoca*, Indo-China, BOURGEOIS, p. 180, N. Arch. Mus. (3) ii : n. spp.

*Sinocaulus laticollis*, China, FAIRMAIRE, p. xv, C.R. Ent. Belg. xxxv, n. sp.

### MALACODERMATA.

[Cf. ABEILLE (2), BOURGEOIS (84, 85, 86), FAIRMAIRE (254, 259, 260, 261), GORHAM (963), HORN (404), LEWIS (535), REITTER (694, 703, 706).]

Geographical distribution of *Lycides* discussed; BOURGEOIS, Am. Fr. 1891, pp. 337-364, map.

*Anthocomus*, n. subgg., cf. *Neotrotus*, *Omphalicus*, and *Paremballus*.

*Aphycetus charopoides*, Taschkent, REITTER, p. 27, Deutsche e. Z. 1891, n. sp.

*Astylus bisæoguttatus*, Ecuador, GORHAM, in Whymper Supp. App. p. 52, n. sp.

*Attalus atnensis*, Sicily, ABEILLE, p. 228, Ann. Soc. Ent. Fr. 1891, n. sp.

*Callotroglops albozonatus*, n. var. *cyaneicollis, atticus*; ABEILLE, p. 226, Ann. Soc. Ent. Fr. 1891.

*Cantharis (Telephorus) paviei*, Indo-China, BOURGEOIS, p. 186, N. Arch. Mus. (3) ii, n. sp.

*Cephaloncus*, Westw., = (*Troglicus*); ABEILLE, p. 406, Ann. Soc. Ent. Fr. 1891.

*Chætomalachius dasytoides*, Kr., referred to *Dasytiscus*, *D. transcaspicus*, Bourg., being a synonym; REITTER, p. 227, Wien. ent. Z. x.

♂ *Cyrebion*, n. g., near *Telephorus*, for *C. laticornis*, n. sp., China ; FAIRMAIRE, p. ccvii, C.R. Ent. Belg. xxxv.

*Cyrtosus dispar*, n. var. *variicollis* ; ABEILLE, p. 230, Ann. Soc. Ent. Fr. 1891.

*C. (Homogynes) baudii*, Spain, ABEILLE, p. 229, Ann. Soc. Ent. Fr. 1891, n. sp.

*Dasytes marginicollis*, Ordubad, REITTER, p. 26, Deutsche e. Z. 1891, n. sp.

*Dasytiscus heydeni*, n. n. for *analisis*, Reitt. ; REITTER, p. 226, Wien. ent. Z. x.

*Diaphanes pygidialis*, p. 182, *patruelis*, *fenetrella*, p. 183, Indo-China, BOURGEOIS, N. Arch. Mus. (3) ii, n. spp.

*Dolichophron kiesewetteri*, Tripolis, REITTER, p. 26, Deutsche e. Z. 1891, n. sp.

*Drilus schwarzi*, Dalmatia, REITTER, p. 246, Wien. ent. Z. x, n. sp.

♂ *Hapalochroüs*, n. n. for *Apalochrous*, Er. ; ABEILLE, p. 212, Ann. Soc. Ent. Fr. 1891.

♂ *Helcophorus*, n. g., for *H. miniatus*, n. sp., Kashmir, FAIRMAIRE, p. cxxix, C.R. Ent. Belg. xxxv.

*Idgia cardoni*, Bengal, BOURGEOIS, p. cxli, C.R. Ent. Belg. xxxv ; *I. granulipennis*, China, FAIRMAIRE, p. ccix, t. c. : n. spp.

*Lamprophorus nepalensis*, larva noticed ; RITSEMA, Tijdschr. Ent. xxxiv, p. cxiv, and *L. nepalensis* and larva figured, pl. x, figs. 2 & 2a, Notes Leyd. Mus. xiii.

*L. nitidicollis*, Kashmir, FAIRMAIRE, p. xc, C.R. Ent. Belg. xxxv, n. sp.

*Laüs trinotialis*, Niger, FAIRMAIRE, p. 246, Ann. Soc. Ent. Fr. 1891 ; *L. jucundus*, Bengal, BOURGEOIS, p. cxl, C.R. Ent. Belg. xxxv ; *L. amenus*, Cambodia, BOURGEOIS, p. 187, N. Arch. Mus. (3) ii : n. spp.

*Listrus aenescens*, p. 53, *flavipennis*, p. 54, Ecuador, GORHAM, in Whympfer Supp. App., n. spp.

*Lobonyx kashmirensis*, Kashmir, FAIRMAIRE, p. cxxx, C.R. Ent. Belg. xxxv, n. sp.

*Luciola anceyi*: sexes described ; BOURGEOIS, p. 185, N. Arch. Mus. (3) ii.

*L. immarginata*, p. 184, *succincta*, p. 186, Indo-China, BOURGEOIS, N. Arch. Mus. (3) ii ; *L. fissicollis*, China, FAIRMAIRE, p. xvi, C.R. Ent. Belg. xxxv : n. spp.

*Lycocerus militaris*, Gorh., and *Telephorus pluricostatus*, Fairm., are one species ; FAIRMAIRE, p. ccviii, C.R. Ent. Belg. xxxv.

*Lycostomus acute-costatus*, p. lxxxix, *auriculatus*, p. xc, Kashmir, FAIRMAIRE, C.R. Ent. Belg. xxxv, n. spp.

*Macrolycus spinicollis*, China, FAIRMAIRE, p. xiv, C.R. Ent. Belg. 1891, n. sp.

*Malachius curticornis*, *laticollis*, *affinis*: characters and synonymy discussed ; SEIDLITZ, Wien. ent. Z. x, pp. 297-299.

*M. flavipalpis*, Transcaucasus, ABEILLE, p. 137, Ann. Soc. Ent. Fr. 1891 ; *M. ensiculus*, Syria, *id. t. c.* p. 405 ; *M. caeruleoscutatus*, Kashmir, FAIRMAIRE, p. cxxx, C.R. Ent. Belg. xxxv : n. spp.



- Malthodes schreiberi*, Görz, REITTER, p. 259, Wien. ent. Z. x, n. sp.  
*Melyresthes*, n. g., between *Dasytides* and *Melyrides*, for *M. cardinalis*, n. sp., Ordubad ; REITTER, p. 27, Deutsche e. Z. 1891.  
*Neotrotus*, n. subg. of *Anthocomus*, ABEILLE, p. 187, Ann. Soc. Ent. Fr. 1891.  
*Omphalius*, n. subg. of *Anthocomus*, ABEILLE, p. 187, Ann. Soc. Ent. Fr. 1891.  
*Paratinus*, n. g. for a part of *Apalochrus*, auct., ABEILLE, p. 220, Ann. Soc. Ent. Fr. 1891.  
*Paremballus*, n. subg. of *Anthocomus*, ABEILLE, p. 187, Ann. Soc. Ent. Fr. 1891.  
*Phengodes picicollis*, Minnesota, HORN, p. 40, Tr. Am. Ent. Soc. xviii, n. sp.  
*Phloxophilus edwardsi*, habits, BRAUNS, Ent. Nachr. xvii, p. 109.  
*Plateros*? *alticola*, Ecuador, GORHAM, in Whympers Supp. App. p. 46, n. sp.  
*Plectonotum*, n. g., near *Silis*, p. 51, for *P. nigrum*, n. sp., Quito, p. 52, GORHAM, in Whympers Supp. App.  
*Pyrocellia grandicollis*, China, FAIRMAIRE, p. xvi, C.R. Ent. Belg. xxxv, n. sp.  
*Rhagonycha araxicola*, Ordubad, REITTER, p. 26, Deutsche e. Z. 1891, n. sp.  
*Silis chimborazona*, Ecuador, GORHAM, in Whympers Supp. App. p. 51, n. sp.  
*Simoderus*, n. g., for *Malachius reflexicollis*, Gebl., ABEILLE, p. 210, Ann. Soc. Ent. Fr. 1891.  
*Sisynophorus dichrous*, Japan ; LEWIS, Ent. M. M. (2) ii, p. 210, n. sp.  
*Telephorus rufipes*, metamorphoses ; PLANET, Le Nat. 1891, p. 136.  
*T. longipennis*, *coriaceus*, Kashmir, FAIRMAIRE, p. xci, C.R. Ent. Belg. xxxv ; *T. biocellatus*, Kashmir, FAIRMAIRE, p. cxxx ; *T. confossicollis*, *asperipennis*, p. ccviii, *impressiventris*, p. ccix, China, FAIRMAIRE, t. c. ; *T. monticola*, Ecuador, GORHAM, in Whympers Supp. App. p. 49 : n. spp.  
*Themus fuliginosus*, Bengal, BOURGEOIS, p. cxxxix, C.R. Ent. Belg. xxxv, n. sp.  
*Tylocerus bimaculatus*, sexual characters and variation noticed ; BOURGEOIS, p. cxxxviii, C.R. Ent. Belg. xxxv.  
*Vesta impressicollis*, China, FAIRMAIRE, p. xv, C.R. Ent. Belg. xxxv, n. sp.  
*Xenismus whympersi*, Ecuador, GORHAM, in Whympers Supp. App. p. 50, n. sp.

## CLERIDÆ.

- [Cf. BLACKBURN (75), FAIRMAIRE (254, 259, 261), REITTER (694).]  
*Allelidea viridis*, Victoria, BLACKBURN, p. 302, Tr. R. Soc. S. Austr. xiv, n. sp.  
*Clerus (Allonyx) 4-maculatus*, habits ; FLEISCHER, p. 229, Wien. ent. Z. x.

↓ *Crobenia*, n. g., near *Necrobia*, for *C. eyrensis*, n. sp., Australia ; BLACKBURN, p. 305, Tr. R. Soc. S. Austr. xiv.

*Macrotelus belamyi*, W. Africa, FAIRMAIRE, p. 247, Ann. Soc. Ent. Fr. 1891, n. sp.

*Metabasis variegata*, S. Australia, BLACKBURN, p. 304, Tr. R. Soc. S. Austr. xiv, n. sp.

*Natalis constricta*, referred to *Cormodes* ; BLACKBURN, p. 303, Tr. R. Soc. S. Austr. xiv.

*Opilo gigas*, n. var. *abdominalis* ; FAIRMAIRE, C.R. Ent. Belg. xxxv, p. ccxci.

*O. subfasciatus*, E. Africa, FAIRMAIRE, C.R. Ent. Belg. xxxv, p. ccxci, n. sp.

↓ *Parapylyus*, n. g., for *Pylus bicinctus*, Newm. ; BLACKBURN, p. 305, Tr. R. Soc. S. Austr. xiv.

↓ *Pylus pygmæus*, S. Australia, BLACKBURN, p. 306, Tr. R. Soc. S. Austr. xiv, n. sp.

↓ *Thanasimorpha*, n. g., for *Tillus bipartitus*, Blanch., and *T. intricata*, n. sp., W. Australia ; BLACKBURN, Tr. R. Soc. S. Austr. xiv, p. 304.

*Tillus discoidalis*, China, FAIRMAIRE, p. ccx, C.R. Ent. Belg. xxxv, n. sp.

*Trichodes ornatus*, Say, colour variation ; HORN, p. 6, Ent. News, ii.

*Trogodendron ephippium*, Boisd., = (*Notoxus ephippiger*, White) ; BLACKBURN, p. 303, Tr. R. Soc. S. Austr. xiv.

#### LYMEXYLONIDÆ, CLOIDÆ, BOSTRICHIDÆ, PTINIDÆ.

[Cf. BLACKBURN (75), FAIRMAIRE (254), FAUVEL (272), REITTER (694), SEMENOW (797), TRYON (876).]

*Apate chan, deserti*, Transcasian region, SEMENOW, p. 351, Hor. Ent. Ross. xxv, n. spp.

*Atractocerus victoriensis*, Australia, BLACKBURN, p. 306, Tr. R. Soc. S. Austr. xiv, n. sp.

*Cis victoriensis*, Australia, BLACKBURN, p. 308, Tr. R. Soc. S. Austr. xiv, n. sp.

↓ *Dryophilodes*, n. g. (*Ptinidæ*), for *D. insignis, australis*, n. spp., Victoria ; BLACKBURN, p. 307, Tr. R. Soc. S. Austr. xiv.

*Eutaphrus gracilipes*, Mogador, p. 28, *quedenfeldti, fulvohirtus*, Tripolis, p. 29, REITTER, Deutsche e. Z. 1891, n. spp.

*Hedobia regalis*, habits ; PORTEVIN, p. clii, Bull. Soc. Ent. Fr. 1891.

*Lasioderma brevis*, Sea of Aral, REITTER, p. 30, Deutsche e. Z. 1891, n. sp.

*Melittomma* (sub *Hylecetus*) *africanus*, Th., = (*castaneum*, Murray) ; FAIRMAIRE, p. 246, Ann. Soc. Ent. Fr. 1891.

*M. auberti*, Senegal, *id. l. c.*, n. sp.

*Orophius dilutipes*, Victoria, BLACKBURN, p. 308, Tr. R. Soc. S. Austr. xiv, n. sp.

*Pseudochina* : sp. injurious to tobacco in Australia described ; TRYON, Agric. Gaz. N.S.W. i, p. 275.

*Ptinus explanatus*, France, FAUVEL, p. 59, Rev. d'Ent. x, n. sp.

## TENEBRIONIDÆ.

[Cf. BATES (33), BLACKBURN (74), CHAMPION (137), FAIRMAIRE (254, 258, 259, 260, 261, 263), HORN (404), KOLBE (479), LEWIS (537), REITTER (692, 694, 700, 703), REY (713), SEMENOW (795, 797), SHARP (963).]

Analytical table for determination of the *Heteromera* of Belgium ; COUCKE, pp. ccexlii-cccxlvii, C.R. Ent. Belg. xxxv.

✓*Achrostus*, n. g., near *Zophobas*, for *A. rufonitens*, n. sp., West Africa ; FAIRMAIRE, Ann. Soc. Ent. Fr. 1891.

✓*Acotulus*, n. g., *Adelostomidarum*, p. 246, for *A. oranensis*, n. sp., Algeria, p. 246 ; REITTER, Wien. Ent. Z. x.

*Adesmia multiplicata*, E. Africa, FAIRMAIRE, C.R. Ent. Belg. xxxv, p. ccxcii, n. sp.

✓*Adonicus*, n. g., near *Perichilus*, Quedf., p. 258, for *A. purpuripennis*, n. sp., Sierra Leone, p. 259 ; FAIRMAIRE, Ann. Soc. Ent. Fr. 1891.

*Akis (Solskia) morawitzi*, Transcaspien region, SEMENOW, p. 363, Hor. Ent. Ross. xxv, n. sp.

*Amarantha*, Motsch., = (*Chariotheca*, Pasc., and *Metaclisa*, Duval) ; LEWIS, Ent. M. M. (2) ii, p. 70.

*A. atrocyanea*, Japan, LEWIS, l. c., n. sp.

✓*Ammozeum*, n. g., *Erodiidarum*, p. 352, for *A. hyalinum*, n. sp., Transcaspien region, p. 353 ; SEMENOW, Hor. Ent. Ross. xxv.

*Anatolica montivaga*, Yangihissar, BATES, p. 58, Col. Sec. Yark. Miss., n. sp.

*Anemia ovatula*, Gaboon, *thoracica*, Sennaar, FAIRMAIRE, p. 250, Ann. Soc. Ent. Fr. 1891, n. spp.

✓*Anephyctus*, n. g., near *Tenebrio*, for *A. hirtulus*, n. sp., Niger ; FAIRMAIRE, p. 257, Ann. Soc. Ent. Fr. 1891.

*Anomalipus expansicollis*, Mozambique, FAIRMAIRE, p. cxci, Bull. Soc. Ent. Fr. 1891, n. sp.

✓*Apatopsis*, n. g., *Pimeliidarum*, for *A. grombcewskii*, p. 368, *conradi*, p. 370, n. spp., Chinese Turkestan ; SEMENOW, Hor. Ent. Ross. xxv.

✓*Ariarathus*, n. g., near *Tenebrio*, for *A. ulomoides*, n. sp., Moupin ; FAIRMAIRE, p. cexi, C.R. Ent. Belg. xxxv.

*Ascelosodis ovoideus*, p. xcii, *inermis*, p. xciii, Kashmir, FAIRMAIRE, C.R. Ent. Belg. xxxv ; *A. assimilis*, *ciliatus*, *concinus*, *haagi*, p. 57, *grandis*, *intermedius*, p. 58, Tibet, BATES, Col. Sec. Yark. Miss. : n. spp.

✓*Asiopus*, n. g., *Adelides*, for *A. opatroides*, n. sp., Ecuador ; SHARP, in Whymp. Supp. App. p. 43.

*Basanus erotyloides*, Japan, LEWIS, Ent. M. M. (2) ii, p. 71, n. sp.

✓*Bioramix*, n. g., *Platyscelides*, p. 69, for *B. pamirensis*, p. 70, *ovalis*, *puncticeps*, Tibet, *asidioides*, Sind Valley, p. 71, n. spp. ; BATES, Col. Sec. Yark. Miss.

✓*Blapidurus*, n. g., near *Blaps*, for *B. crassicornis*, n. sp., Kashmir, FAIRMAIRE, p. xcvi, C.R. Ent. Belg. xxxv ; *B. marginicollis*, Kashmir, FAIRMAIRE, p. cxxxi, C.R. Ent. Belg. xxxv, n. sp.

*Blaps barbara*, Sol., var. = (*substriata*, Sol.) ; BALLION, Soc. Ent. v, p. 153.

*B. stoliczkan*a, Pamir, *indicola*, Sind Valley, p. 61, *perlonga*, *ladakensis*, *kashgarensis*, p. 62, Tibet, BATES, Col. Sec. Yark. Miss. ; *B. urophora*, *lucens*, Kashmir, FAIRMAIRE, p. xcv, C.R. Ent. Belg. xxxv : n. spp.

*Bolitophagus serrifrons*, Reitt., ♂ described ; REITTER, p. 30, Deutsche e. Z. 1891.

↓ *Botiras*, n. g., between *Platyscelis* and *Oncotus*, for *B. striatellus*, p. xcvi, *punctatellus*, *sculptipennis*, p. xcix, n. spp., Kashmir ; FAIRMAIRE, C.R. Ent. Belg. xxxv.

*Cabirus tibialis*, *validipes*, Tashkent, *obtuscollis*, Chodskent, REITTER, p. 224, Wien. ent. Z. x, n. spp.

*Calcar humerale*, Tangier, CHAMPION, p. 387, Tr. E. Soc. 1891, n. sp.

*Capnisa mediocris*, Kashmir, FAIRMAIRE, p. xciii, C.R. Ent. Belg. xxxv, n. sp.

↓ *Chianalus*, n. g., *Platyscelides*, for *C. costipennis*, n. sp., Tibet ; BATES, p. 72, Col. Sec. Yark. Miss.

↓ *Cimicia*, n. g. (*Eurychorides*, near *Lycanthropa*), for *C. spinipes*, n. sp., S. Africa ; FAIRMAIRE, p. lxxxix, Bull. Soc. Ent. Fr. 1891.

↓ *Cælocnemodes*, n. g., *Blaptides*, p. 64, for *C. stoliczkanus*, n. sp., Murree, p. 65, BATES, Col. Sec. Yark. Miss.

↓ *Colpotinus*, n. g., *Pedinides*, for *C. simulator*, n. sp., China, FAIRMAIRE, p. xvii, C.R. Ent. Belg. xxxv.

↓ *Crypsinus*, n. g., near *Gonocnemis*, p. 262, for *C. acutispina*, n. sp., Trop. Africa, p. 263, FAIRMAIRE, Ann. Soc. Ent. Fr. 1891.

*Cyphogenia depressiuscula*, Kashmir, FAIRMAIRE, p. xcii, C.R. Ent. Belg. xxxv ; *C. plana*, *humeralis*, Tibet, BATES, p. 60, in Col. Sec. Yark. Miss : n. spp.

*Cyptus intermedius*, Congo, FAIRMAIRE, p. 251, Ann. Soc. Ent. Fr. 1891, n. sp.

*Derosphærus rufofasciatus*, *rugulicollis*, Guinea, FAIRMAIRE, p. 255, Ann. Soc. Ent. Fr. 1891, n. spp.

*Dichillus pusillus*, Men., nec Reitter, redescribed ; REITTER, p. 222, Wien. ent. Z. x.

*D. reitteri*, Transcaspian region, SEMENOW, p. 361, Hor. Ent. Ross. xxv, n. sp.

↓ *Dichotymus*, n. g., near *Nesioticus*, p. ccxcv, for *D. striatipennis*, n. sp., E. Africa, p. ccxcvi, FAIRMAIRE, C.R. Ent. Belg. xxxv.

*Diodontes semicribrosus*, E. Africa, FAIRMAIRE, p. ccxcii, C.R. Ent. Belg. xxxv, n. sp.

*Eleodes wickhami*, Arizona, p. 41, *longipilosa*, Nevada, p. 42, HORN, Tr. Am. Ent. Soc. xviii, n. spp.

*Encyalesthus cribripennis*, China, FAIRMAIRE, p. ccxii, C.R. Ent. Belg. xxxv, n. sp.

*Epitragus dilutus*, Ecuador, SHARP, in Whympers Supp. App. p. 42, n. sp.

*Ethmus*, Haag., = (*Tynthlobia*, Fair.) and *E. maculata*, Haag., = (*quadricostata*, Fairm.) ; FAIRMAIRE, p. 250, Ann. Soc. Ent. Fr. 1891.

*Eurychora acuminata*, E. Africa, FAIRMAIRE, p. cxciii, C.R. Ent. Belg. xxxv, n. sp.

*Faustia læviuscula*, Kashmir, FAIRMAIRE, p. xcvi, C.R. Ent. Belg. xxxv, n. sp.

✓*Gargilius*, n. g., near *Alphitophagus*, p. 251, for *G. trispinosus*, Zanzibar, *bicornutus*, Ashanti, n. spp., p. 252 ; FAIRMAIRE, Ann. Soc. Ent. Fr. 1891.

*Gauromaia tenuestriata*, Kashmir, FAIRMAIRE, p. cxxxii, C.R. Ent. Belg. xxxv, n. sp.

*Gonocnemis raffrayi*, p. 259, *foveicollis*, *reflexicollis*, p. 261, *incostata*, p. 262, Trop. Africa, FAIRMAIRE, Ann. Soc. Ent. Fr. 1891, n. spp.

*Heliopathes (Olocrates) latipennis*, Marocco, CHAMPION, p. 384, Tr. E. Soc. 1891, n. sp.

*Helops championi*, n. n. for *subæneus*, Reitt., nec Baudi ; REITTER, p. 226, Wien. ent. Z. x.

*H. (Stenomax) calpensis*, p. 389, *H. (Catomus) walkeri*, p. 390, Gibraltar, CHAMPION, Tr. E. Soc. 1891, n. spp.

✓*Hexarhopalus*, n. g. near *Læna*, for *H. sculpticollis*, n. sp., China, FAIRMAIRE, p. xix, C.R. Ent. Belg. xxxv.

*Himastismus* : table of the subgenera and species ; SEMENOW, pp. 355–361, Hor. Ent. Ross. xxv.

*H. reitteri* (= *Sphenaria vestita*, Sem.), Desert of Gobi, p. 353, *chotanicus*, *H. (Asphena) grombcewskii*, Chinese Turkestan, p. 354, *H. (Sphenaria) menetriesi*, Transcaspian region, p. 360, SEMENOW, Hor. Ent. Ross. xxv, n. spp.

*Hoplonyx rufopictus*, Guinea, FAIRMAIRE, p. 259, Ann. Soc. Ent. Fr. 1891, n. sp.

*Hypophlæus teredoides*, Gaboon, FAIRMAIRE, p. 252, Ann. Soc. Ent. Fr. 1891, n. sp.

*Læna ganglbaueri*, Turkey, REITTER, p. 33, Wien. ent. Z. x, n. sp.

*Leptodes insignis* and *turkestanica* : synonymy discussed ; REITTER, p. 273, Wien. ent. Z. x.

*L. reitteri*, Chinese Turkestan, SEMENOW, p. 271, Wien. Ent. Z. x, n. sp.

*Leptomorpha rugulipennis*, Kashmir, FAIRMAIRE, p. xcvi, C.R. Ent. Belg. xxxv ; *L. brevicollis*, Kashmir, *id.* p. cxxxi, *t. c.* : n. spp.

*Melanolophus ater*, Wat., referred to *Phrynocolus* ; KOLBE, S. E. Z. 1891, p. 25.

*Menephilus quadriplagiatus*, Zanzibar, FAIRMAIRE, p. 255, Ann. Soc. Ent. Fr. 1891, n. sp.

*Mesostenopa occidentalis*, Niger, FAIRMAIRE, p. 249, Ann. Soc. Ent. Fr. 1891, n. sp.

*Micrantereus seriegranosus*, E. Africa, FAIRMAIRE, C.R. Ent. Belg. xxxv, p. cxcvi, n. sp.

*Microdera laticollis*, *parvicollis*, Kogyar, BATES, p. 59, Col. Sec. Yark. Miss., n. spp.

*Moluris tentyrioides*, Centr. Africa, FAIRMAIRE, p. 249, Ann. Soc. Ent. Fr. 1891, n. sp.

† *Myatis*, n. g., *Platyscelides*, for *M. humeralis*, p. 73, *quadraticollis*, *variabilis*, p. 74, n. spp., Tibet; BATES, Col. Sec. Yark. Miss.

*Nyctobates senegalensis*, *fusciolatus*, p. 253, *distinguendus*, *rufoplagiatus*, p. 254, Trop. Africa, FAIRMAIRE, Ann. Soc. Ent. Fr. 1891, n. spp.

*Opatrum soricinum*, Reiche, = (*insidiosum*, Fairm.); BEDEL, p. 153, L'Ab. xxvii.

*O. kashgarensis*, Tibet, BATES, pp. 74, Col. Sec. Yark. Miss., n. sp.

*Ocnerna sublaevigata*, Kashgar, BATES, p. 69, Col. Sec. Yark. Miss.; *O. protensa*, Kashmir, FAIRMAIRE, p. xciv, C.R. Ent. Belg. xxxv : n. sp.

*Odontopus major*, Trop. Africa, FAIRMAIRE, p. 258, Ann. Soc. Ent. Fr. 1891, n. sp.

*Paramarygmus globulatus*, E. Africa, FAIRMAIRE, p. ccxcv, C.R. Ent. Belg. xxxv, n. sp.

*Penthicus (Loboderus) gracilis*, Kogyar, BATES, p. 76, Col. Sec. Yark. Miss., n. sp.

*Phaleria*: table of the European species and varieties; REY, pp. 83-86 & 237-239, Rev. d'Ent. x. *P. pallens*, Latr., to be called *P. haemisphaerica*, Küst.; BEDEL, p. 154, L'Ab. xxvii.

*P. sublaevicollis*, Tunis, REY, p. 236, Rev. d'Ent. x, n. sp.

*Phrynocolus undatocostatus*, Centr. Africa, KOLBE, p. 30, S. E. Z. 1891; *P. cultratus*, Niger, FAIRMAIRE, p. 249, Ann. Soc. Ent. Fr. 1891; *P. discoideus*, E. Africa, FAIRMAIRE, p. ccxciv, C.R. Ent. Belg. xxxv : n. spp.

*Pimelia spectabilis*, Kr., referred to *Trigonoscelis*; BALLION, Soc. Ent. v, p. 146, and by KRAATZ, to *Chaetotoma*, t. c. p. 169.

*Platyedema championi*, n. n. for *obscurum*, Blk.; BLACKBURN, p. 139, Tr. R. Soc. S. Austr. xiv.

*Plesiophthalmus ovipennis*, *lineipunctatus*, China, FAIRMAIRE, p. xx, C.R. Ent. Belg. xxxv, n. spp.

† *Plinthochrous*, n. g., near *Gonocnemis*, for *P. gounellei*, n. sp., Guinea; FAIRMAIRE, p. 263, Ann. Soc. Ent. Fr. 1891.

*Prioscelis obsoletus*, Congo, FAIRMAIRE, p. 258, Ann. Soc. Ent. Fr. 1891, n. sp.

*Prosodes rufo-sulcata*, Kashmir, FAIRMAIRE, p. xcv, C.R. Ent. Belg. xxxv; *P. trisulcata*, Tibet, *vicina*, Sind Valley, BATES, p. 64, Col. Sec. Yark. Miss.; *P. oschamini*, p. 366, *novemcostata*, p. 367, S. Turkestan, SEMENOW, Hor. Ent. Ross. xxv : n. spp.

*Psammodes plicipennis*, *quadricostatus*, E. Africa, FAIRMAIRE, p. ccxciii, C.R. Ent. Belg. xxxv, n. spp.

*Pseudoblaps simulatrix*, Kashmir, FAIRMAIRE, p. c, C.R. Ent. Belg. xxxv, n. sp.

*Pterocomma tibialis*, *serrimargo*, p. 67, *convexa*, *semicarinata*, Tibet, p. 68, BATES, Col. Sec. Yark. Miss., n. spp.

† *Reitterella*, n. g., *Leptodidarum*, p. 362, for *R. fusiformis*, n. sp., Transcasian region, SEMENOW, Hor. Ent. Ross. xxv.

*Scotobates calcaratus*, Fab., larva and pupa described ; BEUTENMULLER, p. 13, Psyche, vi.

*Strongylium flavilabre*, *gibbosulum*, p. cexii, *pilosulum*, *chinense*, p. ccxiii, *opucicolle*, *dimidiatum*, p. cexiv, China, FAIRMAIRE, C.R. Ent. Belg. xxxv : *S. denticolle*, Ecuador, SHARP, in Whymper Supp. App. p. 42 : n. spp.

†*Syachis*, n. g., *Tentyriinæ*, near *Capnisa*, p. 55, for *S. himalaicus*, *picornis*, n. spp., Kargil, p. 56 ; BATES, Col. Sec. Yark. Miss.

*Tenebrio atronitens*, China, FAIRMAIRE, p. xvii, C.R. Ent. Belg. xxxv, n. sp.

*Thalpophila carinifrons*, p. 247, *reticulata*, p. 248, Tropical Africa, FAIRMAIRE, Ann. Soc. Ent. Fr. 1891, n. spp.

*Trigonoscelis setosa*, p. 65, *lacerta*, p. 66, Tibet, BATES, Col. Sec. Yark. Miss., n. spp.

*Vieta longepilosa*, p. ccxciv, *protensa*, p. ccxcv, E. Africa, FAIRMAIRE, C.R. Ent. Belg. xxxv, n. spp.

†*Weisea*, n. g., *Trachyscelidarum*, p. 370, for *W. sabulicola*, n. sp, Transcaspian region, p. 370 ; SEMENOW, Hor. Ent. Ross. xxv.

*Xanthotopia tripartita*, W. Africa, FAIRMAIRE, p. 264, Ann. Soc. Ent. Fr. 1891, n. sp.

*Zophosis assimilis*, *crispata*, E. Africa, FAIRMAIRE, p. ccxci, C.R. Ent. Belg. xxxv, n. spp.

#### CISTELIDÆ.

[Cf. BATES (33), BLACKBURN (75), FAIRMAIRE (261), QUEDENFELDT (671), REITTER (698, 706), SEMENOW (797).]

*Allecula (Dictopsis) costipennis*, Murree, BATES, p. 76, Col. Sec. Yark. Miss. ; *A. densaticollis*, *moupinea*, China, FAIRMAIRE, p. ccxv, C.R. Ent. Belg. xxxv : n. spp.

*Anaxo* : table of characters of the species ; BLACKBURN, p. 312, Tr. R. Soc. S. Austr. xiv.

*A. æreus*, Victoria, p. 308, *lindensis*, *affinis*, S. Australia, p. 309, *ater*, *sparsus*, p. 310, *puncticeps*, Victoria, *occidentalis*, W. Australia, p. 311, BLACKBURN, t. c., n. spp.

*Apellatus* : synonymy and sexual distinctions discussed ; BLACKBURN, pp. 313 & 314, Tr. R. Soc. S. Austr. xiv.

*A. nodicornis*, p. 314, *nigricornis*, p. 315, Victoria, BLACKBURN, t. c., n. spp.

†*Balassogloa*, n. g., *Alleculidarum*, p. 372, for *B. sphenarioides*, Turkistan, p. 372, *minor*, Transcaspian region, p. 373, n. spp. ; SEMENOW, Hor. Ent. Ross. xxv.

*Balassogloa*, Sem., and *Steneryx*, Reitt., are the same genus ; REITTER, p. 252, Wien. ent. Z. x.

†*Barycistela*, n. g., p. 327, near *Homotrysis*, for *B. robusta*, n. sp., Queensland, p. 328 ; BLACKBURN, T. R. Soc. S. Austr. xiv.

†*Brachyryptus*, n. g., near *Omophlus*, p. 129, for *B. tripolitanus*, n. sp., Tripolis, p. 130 ; QUEDENFELDT, Ent. Nachr. xvii.

*Chromomæa maculicornis*, p. 315, *rufipennis*, p. 316, Victoria, BLACKBURN, Tr. R. Soc. S. Austr. xiv, n. spp.

*Cistela elliptica*, Moupin, FAIRMAIRE, C.R. Ent. Belg. xxxv, p. cxxiv ; *C. (Cteniopus) simillima, spurcaticornis*, China, FAIRMAIRE, p. xxi, C.R. Ent. Belg. xxxv : n. spp.

*Cteniopus luteus*, Küst., notè on ; REITTER, p. 256, Wien. ent. Z. x.

*Eryx ater*, F., = (*subsulcatus*, Fairm.) ; BEDEL, p. 154, L'Ab. xxvii. *E. (sub Hymenalia) crassicollis*, Fairm., = (*I. bispilosa*, Desb.) ; BEDEL, l. c.

<sup>4</sup>*Hemicistela*, n. g. (an hujus fam. ?), p. 331, for *H. discoidalis*, n. sp., Victoria, p. 332, BLACKBURN, Tr. R. Soc. S. Austr. xiv.

*Homotrystis*: the characters and synonymy of this and allied genera discussed, *Hybrenia* and *Lisa* merged therein ; *H. maculata*, Haag., *carbonaria*, Germ., *rugulosa*, Boisd., characters of ; BLACKBURN, pp. 317-323, Tr. R. Soc. S. Austr. xiv.

*H. lugubris*, Victoria, *ruficornis*, Queensland, p. 322, *limbata*, Victoria, p. 323, *rufa*, p. 324, *tenebrioides, princeps*, p. 325, *nitida, fusca*, p. 326, S. Australia, BLACKBURN, Tr. R. Soc. S. Austr. xiv, n. spp.

<sup>4</sup>*Hypocistela*, n. g., *Cteniopides*, p. 76, for *H. tenuipes*, n. sp., Kogyar, p. 77 ; BATES, Col. Sec. Yark. Miss.

<sup>4</sup>*Nocar*, n. g., p. 328, for *N. latus, debilis*, p. 329, *simplex*, p. 330, n. spp., S. Australia ; BLACKBURN, Tr. R. Soc. S. Austr. xiv.

*Omophlina (sub Podonta), hirtipennis*, Solsky, = (*pubifer*, Reitt., and *P. tenuis*, Kr.) ; REITTER, p. 256, Wien. ent. Z. x.

*Omophlus championi*, Malta, REITTER, p. 260, Wien. ent. Z. x ; *O. emgei*, Salonica, REITTER, p. 199, Wien. ent. Z. x : n. spp.

*Podonta oblonga*, Ol., = (*nigrita*, Fab.) ; BEDEL, p. 154, L'Ab. xxvii.

<sup>4</sup>*Pseudocistela*, n. g., p. 316, for *P. ovalis*, n. sp., Victoria, p. 317 ; BLACKBURN, Tr. R. Soc. S. Austr. xiv.

<sup>4</sup>*Scaletomerus*, n. g., for *S. harpaloides*, p. 330, *proximus*, p. 331, n. spp., S. Australia ; BLACKBURN, Tr. R. Soc. S. Austr. xiv.

## NILIONIDÆ and PYTHIDÆ.

[Cf. BLACKBURN (75).]

*Cutapotia*, Th., noticed and merged in *Cremnodes* ; GORHAM, p. 148, Biol. Centr. Am. Col. vii.

*Lissodema frigidum*, Victoria, BLACKBURN, p. 335, Tr. R. Soc. S. Austr. xiv.

<sup>4</sup>*Neosalpingus*, n. g., for *N. corticalis, dentaticollis*, n. spp., S. Australia ; BLACKBURN, p. 334, Tr. R. Soc. S. Austr. xiv.

<sup>4</sup>*Notosalpingus*, n. g., for *N. ornatus*, n. sp., S. Australia ; BLACKBURN, p. 333, Tr. R. Soc. S. Austr. xiv.

<sup>4</sup>*Trichosalpingus*, n. g., p. 332, for *T. brunneus*, n. sp., Victoria, p. 333 ; BLACKBURN, Tr. R. Soc. S. Austr. xiv.



## MELANDRYIDÆ and LAGRIIDÆ.

[Cf. BATES (33), FAIRMAIRE (261), GANGLBAUER (316), HAUSEN (378), REITTER (694), SEMENOW (797).]

*Abdera flexuosa*, Ol., = (*griseoguttata*, Fairm.); BEDEL, p. 154, L'Ab. xxvii.

*Casonidea denticollis*, China, FAIRMAIRE, p. ccxviii, C.R. Ent. Belg. xxxv, n. sp.

<sup>1</sup>*Chlorophila*, n. subg. of *Lagria*, for *L. (C.) portschinskii*, n. sp., Gan-ssu; SEMENOW, Hor. Ent. Ross. xxv, p. 374.

*Lagria indicola*, Murree, BATES, p. 77, Col. Sec. Yark. Miss.; *L. ophthalmica*, *carinulata*, China, FAIRMAIRE, p. ccxvi, C.R. Ent. Belg. xxxv : n. spp.

*Lagriogonia*, n. g., for *L. humerosa*, n. sp., China, FAIRMAIRE, p. ccxvii, C.R. Ent. Belg. xxxv.

*Lederia japonica*, Japan, REITTER, p. 30, Deutsche c. Z. 1891, n. sp.

*Ommatophorus mastersi*, MacL., referred to *Cistelidæ*; BLACKBURN, p. 335, Tr. R. Soc. Austr. xiv.

*Zilora eugenie*, Austria, GANGLBAUER, p. 132, Wien. ent. Z. x; *Z. canadensis*, Canada, HAUSEN, Can. Rec. iv, p. 319 : n. spp.

## PEDILIDÆ, ANTHICIDÆ, and PYROCHROIDÆ.

[Cf. BLACKBURN (75), CHAMPION (136), FAIRMAIRE (260), HORN (404) REITTER (694), SEMENOW (797).]

*Macratia victoriensis*, Australia, BLACKBURN, p. 336, Tr. R. Soc. S. Austr. xiv, n. sp.

*Anthicus cerastoides*, Sea of Aral, REITTER, p. 30, Deutsche c. Z. 1891, n. sp.

*Mecynotarsus karakumensis*, Transcaspian region, SEMENOW, p. 375, Hor. Ent. Ross. xxv; *M. tenuipes*, Japan, CHAMPION, Ent. M. M. (2) ii, p. 189: n. spp.

<sup>4</sup>*Syzeton*, n. g., *Anthicidæ*?, for *S. latus*, p. 337, *lateralis*, p. 338, n. spp., Victoria; BLACKBURN, Tr. R. Soc. S. Austr. xiv.

<sup>5</sup>*Syzetonellus*, n. g., *Anthicidæ*?, for *S. alpicola*, n. sp., Victoria; BLACKBURN, p. 340, Tr. R. Soc. S. Austr. xiv.

<sup>6</sup>*Syzetoninus*, n. g., *Anthicidæ*?, for *S. mundus*, *inconspicuus*, n. spp., S. Australia; BLACKBURN, p. 339, Tr. R. Soc. S. Austr. xiv.

*Tomoderus denticollis*, N. W. Australia, CHAMPION, p. 188, Ent. M. M. (2) ii, n. sp.

*Pyrochroa subcostulata*, Kashmir, FAIRMAIRE, p. cii, C.R. Ent. Belg. xxxv; *P. facialis*, p. xx, *velutina*, p. xxi, China, *id. t. c.*; *P. californica*, Los Angeles, HORN, p. 45, Tr. Am. Ent. Soc. xviii : n. spp.

## MORDELLIDÆ.

[Cf. BLACKBURN (75), BUDDEBERG (112), CHAMPION (135, 337), EMERY (243), FAIRMAIRE (261), GUILLEBEAU (357).]

*Anaspis septentrionalis*, Scotland, CHAMPION, Ent. M. M. (2) ii, p. 104;

*A. impressa*, Switzerland, GUILLEBEAU, p. 328, MT. Schw. ent. Ges. viii ;  
*A. pictipennis*, Ordubad, REITTER, p. 31, Deutsche e. Z. 1891 : n. spp.

♣ *Calyce*, n. g., near *Mordellistena*, for *C. fulva*, n. sp., Panama, pl. xiii,  
 fig. 21 ; CHAMPION, p. 307, Biol. Centr. Am. Col. iv (2).

*Conalia ebenina*, Central America, CHAMPION, p. 306, pl. xiii, fig. 20,  
 Biol. Centr. Am. Col. iv (2), n. sp.

♣ *Cothurus*, n. g., near *Tomoxia*, p. 259, for *C. iridescens*, n. sp., Mexico,  
 p. 260, pl. xi, fig. 7 ; CHAMPION, Biol. Centr. Am. Col. iv (2).

*Glipa hilaris*, figured, pl. xi, fig. 12, Biol. Centr. Am. Col. iv (2).

*Glipodes*, generic characters discussed, p. 305 ; *G. sericans*, figured,  
 pl. xiii, fig. 19 ; CHAMPION, Biol. Centr. Am. Col. iv (2).

*Mordella* : form of the maxillæ in European species discussed and  
 figured ; CHAMPION, Ent. M. M. (2) ii, p. 122. *M. quadrisignata*, pl. xi,  
 figs. 14-18, *clavicornis*, fig. 13, *picta*, figs. 19-21, figured and variation  
 described, pp. 268-272 ; CHAMPION, Biol. Centr. Am. Col. iv (2).

*M. longecaudata*, Moupin, FAIRMAIRE, p. ccxviii, C.R. Ent. Belg. xxxv ;  
*M. baldiensis*, Victoria, BLACKBURN, p. 341, Tr. R. Soc. S. Austr. xiv ;  
*M. metallica*, pl. xi, fig. 22, *æruiginosa*, fig. 23, p. 273, *dilaticornis*, fig. 24,  
*triangulifer*, fig. 25, p. 274, *signata*, fig. 26, *tripartita*, pl. xii, fig. 1, p. 276,  
*arcuata*, fig. 2, *sellata*, fig. 3, p. 277, *albopicta*, *tetraspilota*, fig. 4, p. 278,  
*leucosticta*, fig. 5, *astuta*, p. 279, *fluctuosa*, fig. 6, *acuticauda*, fig. 7, p. 280,  
*analis*, *octolineata*, fig. 8, p. 281, *subdola*, fig. 9, p. 282, *chevrolati*, fig. 10,  
*sexnotata*, fig. 11, p. 283, *dimidiata*, fig. 12, p. 284, *rufomaculata*, fig. 13,  
*crassipes*, fig. 14, p. 285, *rufovittata*, fig. 15, *badiipennis*, fig. 16, p. 286,  
*flavolineata*, fig. 17, *flavofasciata*, fig. 18, p. 287, *flavonotata*, fig. 19, p. 288,  
*nigromaculata*, fig. 20, *lineatipyga*, fig. 21, p. 289, *univittata*, fig. 22, *atri-*  
*color*, p. 290, *pustulosa*, figs. 23-25, p. 291, *septemnotata*, fig. 26, *mexicana*,  
 fig. 27, p. 292, *cata*, *leucogramma*, pl. xiii, fig. 1, p. 293, *cingulata*, fig. 2,  
 p. 294, *biformis*, fig. 3, p. 295, *rutilicollis*, fig. 5, *erythrocephala*, fig. 6,  
 p. 296, *teapensis*, fig. 7, *flavifrons*, fig. 8, p. 297, *seriata*, fig. 9, p. 298,  
*apicicornis*, fig. 10, *xanthosticta*, fig. 11, p. 299, *sticticoptera*, fig. 12,  
*varicornis*, fig. 13, p. 300, *panamensis*, fig. 14, *t-album*, fig. 15, p. 301,  
*pretiosa*, fig. 16, p. 302, *tenuipes*, fig. 17, *tantilla*, p. 303, *fenestrata*, fig. 18,  
 p. 304, Central America, CHAMPION, Biol. Centr. Am. Col. iv (2) : n. spp.

*Mordellistena abdominalis*, structure of palpi in sexes of ; CHAMPION,  
 Ent. M. M. (2) ii, p. 287. *M. brevicauda*, metamorphoses ; BUDDEBERG,  
 pp. 9-11, JB. nass. Ver. xlv.

*M. longipalpis*, Tunis, EMERY, p. xxxix, Bull. Soc. Ent. Fr. 1891 ; *M.*  
*ephippiata*, pl. xiii, fig. 22, p. 310, *lineatocollis*, fig. 23, *æquinoctialis*, fig. 25,  
 p. 311, *valens*, fig. 27, p. 312, *castaneicolor*, pl. xiv, fig. 1, *veræpaciis*, p. 313,  
*vafæ*, *bicarinata*, p. 314, *callens*, *isthmica*, fig. 2, p. 315, *sexmaculata*,  
 fig. 3, p. 316, *crassipyga*, fig. 5, *forticornis*, fig. 6, p. 317, *rufonotata*, fig. 7,  
*gracilicornis*, fig. 8, p. 318, *opalescenticeps*, fig. 9, p. 319, *sanguinicollis*,  
 fig. 10, *trilinea*, fig. 11, p. 320, *hexastigma*, fig. 12, p. 321, *venusta*, fig. 13,  
*pictipennis*, fig. 14, p. 322, *guttifer*, fig. 15, p. 323, *crassipalpis*, fig. 16,  
*instabilis*, figs. 17 & 18, p. 324, *pilosa*, p. 325, *longipalpis*, fig. 19, p. 326,  
*discicollis*, fig. 20, *vicina*, *atripennis*, fig. 21, p. 327, *incana*, *nigriceps*, fig. 22,

p. 328, *subcanea*, *cinereonotata*, fig. 23, p. 329, *tabascanæ*, *luteifrons*, fig. 24, p. 330, *nigripilis*, *laticollis*, fig. 25, p. 331, *brunneipilis*, pl. xv, fig. 1, *umbrosa*, *murina*, p. 332, *debilis*, p. 333, *rubricollis*, fig. 2, *azteca*, fig. 3, p. 334, *rufopyga*, *sparsa*, fig. 4, p. 335, *dispersa*, *tessellata*, fig. 5, p. 336, *quadrifasciata*, fig. 6, *cincta*, p. 337, *diluta*, fig. 7, p. 338, *mutabilis*, figs. 9-11, p. 339, *luteola*, *isabellina*, fig. 12, p. 340, *basimacula*, fig. 13, *occidentalis*, *oculata*, p. 341, *filicornis*, fig. 14, *flavicornis*, fig. 15, p. 342, *funerea*, *distorta*, fig. 16, p. 343, *curvimana*, fig. 17, *xanthopyga*, fig. 18, p. 344, *nigerrima*, fig. 19, *annulipyga*, fig. 20, p. 345, *crux*, fig. 21, p. 346, *beata*, fig. 22, *perezigua*, p. 347, *minutissima*, fig. 23, *palpalis*, fig. 24, p. 348, *pulicaria*, *fasciculata*, fig. 25, p. 349, *festiva*, fig. 26, p. 350, Central America, CHAMPION, Biol. Centr. Am. Col. iv (2), n. spp.

*Naucles*, n. g., near *Pentaria*, for *N. tibialis*, p. 257, pl. xi, fig. 6, *basalis*, *quercus*, *affinis*, p. 258, n. spp., Central America, CHAMPION, Biol. Centr. Am. Col. iv (2).

*Tomoxia spinifer*, pl. xi, fig. 8, *contracta*, fig. 9, p. 261, *fulviceps*, fig. 10, *interrupta*, fig. 11, p. 262, Central America, CHAMPION, Biol. Centr. Am. Col. iv (2), n. spp.

## CANTHARIDÆ.

[Cf. BATES (33), CHAMPION (337), ESCHERICH (248, 249, 250), FAIRMAIRE (254, 259, 261), HORN (402, 404), KOLBE (479), SEMENOW (797), SHARP (963).]

*Calospasta*: the characters of the species tabulated; HORN, p. 99, P. Am. Phil. Soc. xxix.

*C. histrionica*, p. 100, *morrisoni*, p. 102, California, HORN, P. Am. Phil. Soc. xxix, n. spp.

*Cantharis spissicornis*, China, FAIRMAIRE, p. xxiii, C.R. Ent. Belg. xxxv; *C. discipennis*, Kashmir, *id.* p. c, t. c.; *C. flavoangulata*, Kashmir, *id.* p. cxxxii, t. c.; *C. telekyi*, E. Africa, *id.* p. ccxcvii, t. c.: n. spp.

*Cochliophorus*, n. g., for *C. reitteri*, n. sp., Greece; ESCHERICH, Deutsche Z. 1891, p. 16.

*Doridea*, Westw., characters and systematic position noticed; *D.* (sub *Leptura*) *tenuicollis*, Fab., = (*curculionoides*, Westw.); FAIRMAIRE, pp. 265 & 266, Ann. Soc. Ent. Fr. 1891.

*Epicauta cyclops*, E. Africa, FAIRMAIRE, C.R. Ent. Belg. xxxv, p. ccxcvii; *E. quadratcollis*, Kashmir, *id.* p. ci, t. c.; *E. haagi*, Murree, BATES, p. 78, Col. Sec. Yark. Miss.; *E. straba*, California, p. 42, *merkeliana*, Arizona, *heterodera*, Florida, p. 43, HORN, Tr. Am. Ent. Soc. xviii: n. spp.

*Henous cardui*, figured, pl. xvii, fig. 5; Biol. Centr. Am. Col. iv (2).

*Iletica pallidipennis*, E. Africa, FAIRMAIRE, C.R. Ent. Belg. xxxv, n. sp.

*Lytta* and *Epicauta* not distinct; ESCHERICH, Soc. Ent. vi, p. 11. *L. coccinea*, Fab., referred to *Zonitis*; FAIRMAIRE, p. 264, Ann. Soc. Ent. Fr. 1891.

*L. vittipennis*, Central Africa, KOLBE, p. 34, S. E. Z. 1891, n. sp.

*Meloe tropicus*, pl. xvii, fig. 1, *lavis*, fig. 3, figured; Biol. Centr. Am. Col. iv (2).

*M. transversicollis*, *semicoriaceus*, Kashmir, FAIRMAIRE, p. cii, C.R. Ent. Belg. xxxv ; *M. servulus*, Tibet, BATES, p. 77, *Col. Sec. Yark. Miss.* ; *M. gracilior*, *longipennis*, p. xxii, *lobicollis*, p. xxiii, China, FAIRMAIRE, C.R. Ent. Belg. xxxv ; *M. dugesi*, pl. xvii, fig. 2, p. 366, *gracilicornis*, fig. 4, p. 367, Mexico, CHAMPION, Biol. Centr. Am. Col. iv (2) ; *M. (Pseudomeloë) sexguttatus*, Ecuador, SHARP, in Whymper Supp. App. p. 43 : n. spp.

*Mylabris goutelli*, Fairm., and *Zonabris przewalskyi*, Doc., are one species ; FAIRMAIRE, p. xxiii, C.R. Ent. Belg. xxxv.

*Enas deserti*, Transcaspien region, SEMENOW, p. 377, Hor. Ent. Ross. xxv, n. sp.

*Pyrota akhurstiana*, Arizona, HORN, p. 44, Tr. Am. Ent. Soc. xviii, n. sp.

*Sitaris (Criolis) pectoralis*, Kogyar, BATES, p. 79, *Col. Sec. Yark. Miss.*, n. sp.

*Stenodera* and allied forms, synonymical list of ; ESCHERICH, pp. 54 & 55, Wien. ent. Z. x.

*Tegrodera erosa*, n. var. *latecincta* ; HORN, p. 44, Tr. Am. Ent. Soc. xviii.

*Tetraonyx tigridipennis*, Richard, = (*borrei*, Haag) ; BEDEL, p. vii, Bull. Soc. Ent. Fr. 1891.

*Zonabris korbi*, Spain, ESCHERICH, p. 53, Wien. ent. Z. x, n. sp.

*Zonitis* : revision of the palaearctic species ; ESCHERICH, Deutsche e. Z. 1891, pp. 225, &c. *Z. thoracica*, Lap., = (*analisis*, Ab.) ; BEDEL, p. 154, L'Ab. xxvii. *Z. præusta*, var., = (*analisis*, Ab.), *seminigra*, Reitt., and *gibbicollis*, Ab., are one species ; also *rubricollis*, Ab., and *ruficollis*, Friv. ; ESCHERICH, Wien. ent. Z. x, pp. 53 & 54. *Z. anatolica*, Friv., referred to *Stenodera* ; id. l. c. *Z. funeraria*, Fairm., is a form of *fulvipennis*, Fab. ; id. t. c. p. 55.

*Z. novercalis*, Algeria, p. 237, *laticollis*, East Mediterranean, p. 238, ESCHERICH, Deutsche e. Z. 1891 ; *Z. auricoma*, Hungary, &c., ESCHERICH, p. 54, Wien. ent. Z. x ; *Z. nigripictus*, Kashmir, FAIRMAIRE, p. cxxxiii, C.R. Ent. Belg. xxxv : n. spp.

#### RHIPIDOPHORIDÆ and STYLOPIDÆ.

[Cf. CHAMPION (337), CHAPMAN (138), CHABAUT (140 to 144), DOMINIQUE (206), FAIRMAIRE (257), KRAATZ (492), SEMENOW (797).]

*Emenadia flabellata* : metamorphoses ; CHABAUT, Mém. Ac. Vaucluse, x, pp. 83, &c., pl. ; also Ann. Soc. Ent. Fr. 1891, pp. 447-456, J. Microgr. xv, pp. 89-92, and C.R. cxii, p. 350. The following spp. figured :—*flavipennis*, pl. xvi, fig. 5, *bifoveata*, fig. 6, *octomaculata*, fig. 10, *pectinata*, fig. 11, *cruenta*, fig. 12, *limbata*, figs. 13-16, *discicollis*, figs. 17 & 18, their variation, &c., noticed, pp. 354-359 ; CHAMPION, Biol. Centr. Am. Col. iv (2).

*E. grombcezewskii*, S. Turkestan, SEMENOW, p. 377, Hor. Ent. Ross. xxv ; *E. excavata*, pl. xvi, figs. 7 & 8, p. 354, *carinipennis*, fig. 9, p. 355, Mexico, CHAMPION, t. c. : n. spp.

*Metæcus paradoxus* : oviposition ; CHAPMAN, Ent. M. M. (2) ii, p. 18.

*Pelecotomoides nubila*, figured, pl. xvi, figs. 1 & 2, CHAMPION, Biol. Centr. Am. Col. iv (2).

*P. lineata*, p. 351, pl. xvi, fig. 3, *bivittata, nebulosa*, fig. 4, p. 352, Central America, CHAMPION, t. c., n. spp.

*Rhipidius apicipennis*, Thuringia, KRAATZ, p. 358, pl. v, Deutsche e. Z. 1891, n. sp.

*Rhipidophorus morawitzi*, Chinese Turkestan, SEMENOW, p. 376, Hor. Ent. Ross. xxv ; *R. rex*, pl. xvi, fig. 19, *lævicollis*, fig. 20, p. 360, *flaviventris*, fig. 21, p. 361, *tuberculatus*, fig. 22, p. 362, *hyalinus*, fig. 24, *simplex*, fig. 25, p. 363, Central America, CHAMPION, Biol. Centr. Am. Col. iv. (2) : n. spp.

*Stylops*, sp. (in *Andrena flessæ*) : metamorphoses ; DOMINIQUE (206).

### ÆDEMERIDÆ.

[Cf. BLACKBURN (75), FAIRMAIRE (260, 261), REITTER (694), SEMENOW (797), SHARP (963).]

*Ananca debilis*, Ecuador, SHARP, in Whympers Supp. App. p. 44, n. sp.

*Chrysanthia fuscimembris*, Kashmir, FAIRMAIRE, p. cxxxiv, C.R. Ent. Belg. xxxv, n. sp.

*Ganglbaueria*, n. g. : *Ædemeridarum*, p. 378, for *G. collaris*, n. sp., Chinese Turkestan, p. 379, SEMENOW, Hor. Ent. Ross. xxv.

*Ischnomera semiiflava*, Ordubad, I. (*Asclera*) *flavipes*, Ussuri, REITTER p. 32, Deutsche e. Z. 1891, n. sp.

*Ædemera flaviventris*, Moupin, FAIRMAIRE, p. ccxix, C.R. Ent. Belg. xxxv, n. sp.

*Saloninus*, n. g., between *Calopus*, *Sparedrus*, for *S. nebulosus*, n. sp., Kashmir, FAIRMAIRE, p. cxxxiii, C.R. Ent. Belg. xxxv.

*Trichananca*, n. g., for *T. victoriensis*, n. sp., Australia, BLACKBURN, p. 341, Tr. R. Soc. S. Austr. xiv.

### CURCULIONIDÆ.

[Cf. AURIVILLIUS (25), BEDEL (47), BLANCHARD (77), BUDDENBERG (112), DECAUX (175), DESBROCHERS (179–182), DIETZ (185), DOHRN (203), FAIRMAIRE (254, 259, 261), FAUST (266–270), KOLBE (479), OLLIFF (634, 963), PETRI (649), QUEDENFELDT (670), REITTER (694, 695, 699, 701, 703, 706), RITSEMA (729, 730), ROELOFS (744, 745, 746), SHARP (804, 805, 337), STIERLIN (846, 848, 849), TOURNIER (860), WEISE (954).]

The *Otioryhynchine* to consist of two series, viz. : an apterous series and a winged series ; SHARP, p. 87, Biol. Centr. Am. Col. iv (3).

Monograph of the N. American *Anthonomini* ; DIETZ, Tr. Am. Ent. Soc. xviii, pp. 177–276.

*Acalles caucasicus*, Caucasus, REITTER, p. 240, Wien. ent. Z. x, n. sp.

*Acherus*, n. g., near *Oxyopisthen*, p. 173, for *A. nigricans*, n. sp., Gaboon, p. 174, ROELOFS, Notes Leyd. Mus. xiii.

*Aclees senegalensis*, Niger, FAIRMAIRE, p. 267, Ann. Soc. Ent. Fr. 1891; *A. bispinulus*, Bengal, DESBROCHERS, p. cccviii, C.R. Ent. Belg. xxxv, n. sp.

*Alaocyba (Raymondia) stussineri*, Laibach, REITTER, p. 260, Wien. ent. Z. x, n. sp.

† *Alycodes*, n. g., *Anthonomini*, p. 262, for *A. dubius*, n. sp., Canada, p. 263; DIETZ, Tr. Am. Ent. Soc. xviii.

↓ *Amathynetes*, n. g., near *Listroderes*, p. 70, for *A. alticola*, *simulans*, n. spp., Ecuador, p. 71; OLLIFF, in Whymper Supp. App.

*Amphidees major*, pl. iv, fig. 13, p. 97, *macer*, fig. 15, p. 98, *nasutus*, *alternans*, p. 99, *pilosus*, fig. 16, *longulus*, fig. 17, p. 100, Mexico, SHARP, Biol. Centr. Am. Col. iv (3), n. spp.

*Amphideritus brevis*, *pygmaeus*, Ecuador, OLLIFF, in Whymper Supp. App. p. 68, n. sp.

*Anchonus monticola*, p. 72, *altarensis*, p. 73, Ecuador, OLLIFF, in Whymper Supp. App., n. spp.

✓ *Anthonomochæta*, n. subg. of *Anthonomus*; DIETZ, p. 246, Tr. Am. Ent. Soc. xviii.

✓ *Anthonomocyllus*, n. subg. of *Anthonomus*; DIETZ, p. 191, Tr. Am. Ent. Soc. xviii.

✓ *Anthonomopsis*, n. g., for *Anthonomus mixtus*, Lec.; DIETZ, p. 247, Tr. Am. Ent. Soc. xviii.

✓ *Anthonomorphus*, n. subg. of *Anthonomus*; DIETZ, p. 194, Tr. Am. Ent. Soc. xviii.

*Anthonomus*: the N. American species arranged in the following subgenera—*Coccotorus*, Lec., *Anthonomocyllus*, *Anthonomomorphus*, *Paranthonomus*, *Trichobaropsis*, *Leptarthrus*, *Anthonomus*, and *Cnemocyllus*; DIETZ, p. 189, Tr. Am. Ent. Soc. xviii.

*A. morosus*, Minussinsk, p. 405, *gentilis*, Caucasus, p. 406, FAUST, Hor. Ent. Ross. xxv; *A. (Coccotorus) hirsutus* (Bruner), p. 191, *A. (Anthonomocyllus) leucostictus*, *elegans*, p. 193, N. America, *A. (Anthonomorphus) peninsularis*, p. 195, *pervilis*, p. 196, Lower California, *A. (Trichobaropsis) tezanus*, p. 197, *A. (Leptarthrus) julichi*, *irroratus*, Florida, p. 198, *A. (Paranthonomus) vulpinus*, p. 201, *A. virgo*, p. 206, *bolteri*, *rubellus*, p. 208, *confusus*, p. 209, *melancholicus*, p. 211, *subguttatus*, p. 213, *consimilis*, *vespertinus*, p. 216, *concinus*, p. 217, *sexguttatus*, *interstitialis*, p. 219, *ebeninus*, p. 221, *albopilosus*, p. 222, *xanthocnemus*, *aneolus*, p. 223, *faber*, *effetus*, p. 224, *dissimilis*, *orchestoides*, p. 226, *squamulatus*, p. 230, *molo-chinus*, p. 231, *murinus*, p. 232, *ochreopilosus*, p. 233, *latiusculus*, p. 235, *floralis*, p. 238, *A. (Cnemocyllus) ornatulus*, *figuratus*, p. 241, *jacobinus*, p. 242, *ligatus*, *lineatulus*, p. 245, *A. (Anthonomochæta) heterogenus*, p. 247, all from N. America, Lower California, or Florida, DIETZ, Tr. Am. Ent. Soc. xviii: n. spp.

↓ *Aparopion suturidens*, Italy, REITTER, p. 248, Wien. ent. Z. x, n. sp.

↓ *Apatorhynchus*, n. subg. of *Zygops*, q.v.; DESBROCHERS, p. 40, Ann. Ent. Belg. xxxv.

*Apion*: synonymical notes resulting from an examination of the Schön-

herrian types of European species ; DESBROCHERS, pp. 317-328, Ann. Soc. Ent. Fr. 1891 : synonymical notes and observations on a large number of European species ; DESBROCHERS, pp. xlvii-xlix, Bull. Soc. Ent. Fr. 1891. *A. buddebergi*, metamorphoses ; BUDDEBERG, pp. 11-13, JB. nass. Ver. xlv. *A. steveni* redescribed ; FAUST, p. 121, Deutsche e. Z. 1891.

*A. æstimatum*, Ordubad, *perlongum*, Sarepta, p. 410, *samarense*, p. 411, *avidum*, p. 412, Samara, *offensum*, Crimea, *martjanovi*, p. 413, Miussinsk, *otiosum*, p. 414, *laudabile*, p. 415, Transcaspian region, FAUST, Hor. Ent. Ross. xxv ; *A. insignicolle*, Tauria, *rectipes*, *edentatum*, N. Africa, p. lvi, *simillimum*, S. Russia, *subsquamosum*, Portugal, *confusum*, N. Africa, *parvithorax*, *simplicipes*, Maritime Alps, p. lvii, *medium*, N. Africa, p. lviii, DESBROCHERS, Bull. Soc. Ent. Fr. 1891 ; *A. obnoxium*, Nagpore, FAUST, p. 282, S. E. Z. 1891 ; *A. abruptum*, p. 293, *protractum*, p. 294, *bulbinasum*, *sulcirostre*, p. 295, *daimio*, p. 296, Japan, SHARP, Tr. E. Soc. 1891 ; *A. terminale*, *inflatipennis*, pl. iii, fig. 19, *latipennis*, p. 81, *juno*, fig. 20, *gibbosum*, fig. 21, *lentum*, fig. 22, p. 82, *amœnum*, *grallarium*, pl. ii, fig. 23, p. 83, *samson*, pl. iii, fig. 23, *latipes*, pl. iii, fig. 24, p. 84, *basale*, fig. 25, p. 85, Central America, SHARP, Biol. Centr. Am. Col. iv (3) ; *A. andinum*, Ecuador, OLLIFF, in Whymper Supp. App. p. 78 : n. spp.

*Apoderes gemmosus* and *gemmatus*, note on their distinctions ; FAUST, p. 283, S. E. Z. 1891. *A. tranquebaricus*, varr. = (*crenatus* and *javanicus*, Jek.) ; DESBROCHERS, p. ccclii, C.R. Ent. Belg. xxxv.

*Astycus 4-virgatus*, *griseus*, Bengal, DESBROCHERS, p. cccliv, C.R. Ent. Belg. xxxv, n. sp.

*Atheteles*, Pasc., merged in *Pantomorus* ; SHARP, p. 152, Biol. Centr. Am. Col. iv (3).

*Auletes constrictus*, Ordubad, REITTER, p. 32, Deutsche e. Z. 1891, n. sp.

*Bagous interruptus*, Nagpore, *sumatrensis*, Sumatra, FAUST, p. 279, S. E. Z. 1891, n. spp.

*Balaninus herbsti*, habits of larva ; BRAUNS, Ent. Nachr. xvii, p. 108.

*B. bomfordi*, Calcutta, FAUST, p. 286, S. E. Z. 1891 ; *B. flavo-arcuatus*, Java, DESBROCHERS, C.R. Ent. Belg. xxxv, p. ccclii : n. spp.

*Baridius centrodenuatus*, Bengal, DESBROCHERS, p. ccclix, C.R. Ent. Belg. xxxv, n. sp.

*Baris cuprirostris*, metamorphoses ; BUDDEBERG, pp. 13-15, JB. nass. Ver. xlv.

*Barynotus mærens*, injurious to plants ; BIRD, Ent. M. M. (2) ii, p. 222.

✓ *Blosyridius*, n. g., near *Blosyrus*, p. ccxcviii, for *B. vestitus*, n. sp., E. Africa, p. ccxcix ; FAIRMAIRE, C.R. Ent. Belg. xxxv.

*Blosyrus sculpticollis*, E. Africa, FAIRMAIRE, p. ccxcviii, C.R. Ent. Belg. xxxv, n. sp.

*Bothynoderes emgei*, Greece, STIERLIN, MT. Schw. ent. Ges. viii, p. 272 ; *B. amicus*, Pamir, p. 393, *steveni*, Caucasus, p. 394, *bohemani*, Kar-maktshi, p. 395, FAUST, Hor. Ent. Ross. xxv : n. spp.

*Brachyaspistes bituberosus*, Bengal, DESBROCHERS, p. cccliv, C.R. Ent. Belg. xxxv, n. sp.

*Brachyderes* : notes on the synonymy given by Desbrochers ; REITTER, p. 257, Wien. ent. Z. x.

↓ *Bradyrhynchus*, n. g., near *Epicerus*, p. 140, for *B. brevirostris*, pl. vi, fig. 7, *tolucae*, p. 141, *rugicollis*, p. 142, n. spp., Mexico ; SHARP, Biol. Centr. Am. Col. iv (3).

↓ *Bufomicrus*, n. g., near *Epicerus*, for *B. squamosus*, pl. vi, fig. 10, p. 145, *globipennis*, *cristatus*, fig. 11, p. 146, n. spp., Central America ; SHARP, Biol. Centr. Am. Col. iv (3).

↓ *Caccophryastes*, n. g., near *Ophryastes*, for *C. lineatus*, n. sp., Mexico, pl. iv, fig. 6 ; SHARP, p. 92, Biol. Centr. Am. Col. iv (3).

↓ *Cacochromus*, n. g., for *Epicerus carteri*, Chev., which is figured, pl. vi, fig. 6 ; SHARP, Biol. Centr. Am. Col. iv (3).

*Calandra oryzae*, habits in Australia ; OLLIFF, pp. 284-287, pl. vi, Agric. Gaz. N.S.W.

↓ *Calvertius*, n. g. (*Hylobiides*), for *C. araucariae*, n. sp., Chili ; SHARP, Ann. N. H. (6) vii.

↓ *Catarhynchus*, n. g. (*Oleogonides*) for *C. troglodytes*, n. sp., Bengal ; DESBROCHERS, p. ccclix, C.R. Ent. Belg. xxxv, n. sp.

*Ceuthorrhynchidius gobanzi*, Villach, REITTER, p. 262, Wien. ent. Z. x, n. sp.

*Ceuthorrhynchus nanus*, Gyll., larva described ; WEISE, p. 377, Deutsche e. Z. 1891. *C. punctiger* and allies, distinctive characters ; WEISE, p. 376, Deutsche e. Z. 1891.

*C. tournieri*, Algeria, TOURNIER, L'Ent. Genev. i, p. 192, n. sp.

↓ *Cionistes*, n. g., *Anthonomini*, p. 187, for *C. insolens*, n. sp., California, p. 188 ; DIETZ, Tr. Am. Ent. Soc. xviii.

↓ *Cleistolophus*, n. g., near *Epicerus*, for *C. subfasciatus*, p. 143, *instabilis*, p. 144, pl. vi, fig. 9, n. spp., Central America, and including *Epicerus similis*, Chev. ; SHARP, Biol. Centr. Am. Col. iv (3).

*Cleonus (Bothynoderes) crassiusculus*, E. Africa, FAIRMAIRE, C.R. Ent. Belg. xxxv, p. ccxcix ; *C. paraleucosomus*, Bengal, DESBROCHERS, p. ccclvii, C.R. Ent. Belg. xxxv : n. spp.

↓ *Cnemocyllus*, n. subg. of *Anthonomus* ; DIETZ, p. 239, Tr. Am. Ent. Soc. xviii.

*Caliodes congener*, Foerst., is *lamii*, Fab. ; HEYDEN, p. 20, Rev. d'Ent. x.

*Compsus whympersi*, Ecuador, OLLIFF, p. 63, in Whympers Supp. App., n. sp.

*Corigetis cephalotes*, Djizak, FAUST, p. 116, Deutsche e. Z. 1891 ; *C. tenuicornis*, p. 269, *moratus*, *disjunctus*, p. 270, E. India, FAUST, S. E. Z. 1891 : n. spp.

*Cossonus coloratus*, Ecuador, OLLIFF, in Whympers Supp. App. p. 80, n. sp.

*Cylas impunctatus*, Nagpore, FAUST, p. 282, S. E. Z. 1891, n. sp.

*Cyphicerus juvenicus*, p. 271, *ornatus*, p. 272, *deplanatus*, p. 273, E. India, FAUST, S. E. Z. 1891, n. spp.

↓ *Cyrtopisthen*, n. g. (*Calandridæ*), for *C. rubicundum*, n. sp., Gaboon ; AURIVILLIUS, p. 369, Öfv. Ak. Förh. 1891.



*Cyrtotrachelus* : cf. *Roelofsia*.

↓ *Deamphus*, n. g., *Epicærina*, p. 102, for *D. brevipennis*, pl. v, fig. 1, *deceptor*, *latifrons*, fig. 2, p. 103, *puncticollis*, p. 104, n. spp., Central America ; SHARP, Biol. Centr. Am. Col. iv (3).

*Deracanthus komarovi*, Merv, FAUST, p. 391, Hor. Ent. Ross. xxv, n. sp.

*Dereodus himalayanus*, E. India, FAUST, p. 262, S. E. Z. 1891, n. sp.

↓ *Derosomus*, n. g. *Sciaphilina*, for *D. fragilis*, pl. vii, fig. 5, *setosus*, n. spp., Central America ; SHARP, p. 168, Biol. Centr. Am. Col. iv (3).

*Dicranthus elegans* : habits ; BRAUNS, Ent. Nachr. xvii, p. 107.

↓ *Diorynotus*, n. subg. of *Epicærus*, for various new species recorded below under *Epicærus* ; SHARP, p. 105, Biol. Centr. Am. Col. iv (3).

*Dorytomus tremulæ* : larva noticed ; BRISCHKE, Schr. Ges. Danz. (2) vii, 3, p. 8.

*Echinocnemus pruinosis*, Nagpore, FAUST, p. 279, S. E. Z. 1891, n. sp.

*Elleschus angustatus*, Arizona, DIETZ, p. 265, Tr. Am. Ent. Soc. xviii, n. sp.

↓ *Entypotrachelus*, n. g. *Oosominarum*, p. 26, for *E. meyeri*, n. sp., Trop. Africa ; KOLBE, p. 27, S. E. Z. 1891.

*Epagrius*, Schön. : this name to be used for *Graphorhinus*, Lac. ; SHARP, p. 128, Biol. Centr. Am. Col. iv (3).

*E. gravidus*, p. 131, *morosus*, *curvipes*, pl. v, fig. 19, p. 131, *variolosus parades*, fig. 20, p. 132, *hystericulus*, *hispidus*, fig. 21, p. 133, *constans*, fig. 22, *simplex*, p. 134, *opacus*, *jugicola*, fig. 23, *foveicollis*, fig. 24, p. 135, *smithi*, fig. 25, p. 136, *præteritus*, pl. vi, fig. 1, p. 137, *lævinasus*, *pumilus*, fig. 3, p. 138, *inæqualis*, fig. 5, *samson*, fig. 2, p. 139, *grandis*, fig. 4, p. 140, Central America, SHARP, t. c., n. spp.

↓ *Ephelops*, n. g. *Anthonomini*, for *E. triguttatus*, n. sp., Florida ; DIETZ, p. 261, Tr. Am. Ent. Soc. xviii.

*Epicærina*, definition of ; SHARP, p. 101, Biol. Centr. Am. Col. iv (3).

*Epicærus* (*Diorynotus*) *vilis*, pl. iv, fig. 18, *cognatus*, p. 105, *calvus*, fig. 19, *sulcirostris*, *niger*, p. 106, *centralis*, *æqualis*, fig. 20, *uniformis*, p. 107, *coxalis*, fig. 21, p. 108, *costicollis*, *costatus*, fig. 22, p. 109, Mexico ; *E. inflatus*, pl. v, fig. 5, *fronteræ*, fig. 6, p. 112, *reversus*, p. 113, *sturmi*, *championi*, fig. 7, p. 114, *tenuis*, *pedestris*, *capetillensis*, p. 115, *squalidus*, *bicolor*, p. 116, *oscillator*, fig. 8, p. 117, *minor*, fig. 9, *monclovæ*, fig. 10, p. 118, *durangoensis*, fig. 11, *planirostris*, fig. 12, p. 119, *amulæ*, *lateralis*, fig. 13, p. 120, *decoratus*, *oculatus*, fig. 14, p. 121, *squamosus*, *marginatus*, p. 122, *scutellaris*, pl. iv, fig. 25, *insolitus*, pl. v, fig. 15, p. 123, *godmani*, pl. iv, fig. 24, *pyriformis*, fig. 23, p. 124, *sexcostatus*, fig. 16, *hægei*, p. 125, *concolor*, p. 126, *biformis*, fig. 17, *pavidus*, p. 127, *impar*, p. 128, Central America, SHARP, Biol. Centr. Am. Col. iv (3) : n. spp.

↓ *Epimechus*, n. g. *Anthonomini*, p. 257, for *E. mimicus*, p. 258, *curvipes*, *soriculus*, p. 259, *adspersus*, *nevadicus*, p. 260, n. spp., N. America ; DIETZ, Tr. Am. Ent. Soc. xviii.

*Episomus pracux*, E. India, FAUST, p. 265, S. E. Z. 1891, n. sp.

↓ *Epitosus*, n. g., near *Epicærus*, for *E. boops*, n. sp., Guatemala, pl. vi, fig. 15 ; SHARP, p. 150, Biol. Centr. Am. Col. iv (3).

*Erirhinoides distinctus*, Chimborazo, OLLIFF, in Whymper Supp. App. p. 76, n. sp.

*Erirhinus globicollis*, Fairm., and *Echinocnemus confusus*, Faust, are one species; HEYDEN, p. 20, Rev. d'Ent. x.

*E. glaber*, Ecuador, OLLIFF, in Whymper Supp. App. p. 76, n. sp.

*Esamus princeps*, Nagpore, p. 263, *iracundus*, Tenasserim, p. 264, FAUST, S. E. Z. 1891, n. spp.

† *Euclyptus*, n. g. *Anthonomini*, p. 271, for *E. testaceus*, n. sp., New York, p. 272; DIETZ, Tr. Am. Ent. Soc. xviii.

*Eugithopus elegans*, Philippines, ROELOFS, Notes Leyd. Mus. xiii, p. 145, pl. viii, fig. 5, n. sp.

† *Eumestorus*, n. g., p. 148, for *Epicerus luctuosus*, Chev., figured, pl. vi, fig. 14, and *E. proximus*, n. sp., Mexico, p. 149; SHARP, Biol. Centr. Am. Col. iv (3).

*Eupagoderes constrictus*, pl. iv, fig. 7, p. 93, *prolatus*, fig. 9, *mexicanus*, fig. 10, *durangoensis*, p. 94, *squalidus*, p. 95, *cretaceus*, *gracilis*, fig. 12, p. 96, Mexico, SHARP, Biol. Centr. Am. Col. iv (3), n. spp.

† *Eustalida*, n. g. *Cyphinarum*, for *E. bomfordi*, n. sp., Calcutta, FAUST, p. 264, S. E. Z. 1891, n. sp.

*Geotragus* (and *Pachynotus*), characters of; FAUST, p. 262, S. E. Z. 1891.

*Gymnetron solutum*, p. 408, *brisouti*, p. 409, E. Siberia, FAUST, Hor. Ent. Ross. xxv, n. spp.

*Foucattia championi*, Corfu, p. 214, *kraatzi*, S. France, p. 215, REITTER, Wien. ent. Z. x, n. spp.

*Haplorhynchus valdani*, ♀ described; ROELOFS, p. 172, Notes Leyd. Mus. xiii.

† *Helicorrhynchus*, n. g., near *Otiorhynchus*, p. 61, for *H. vulsus*, n. sp., Ecuador, p. 62; OLLIFF, in Whymper Supp. App.

† *Heterapion*, n. g., near *Apion*, for *H. femoratum*, pl. iii, fig. 26, p. 85, *infirme*, p. 86, n. spp., Central America; SHARP, Biol. Centr. Am. Col. iv (3).

† *Hilipomorphus*, n. g. (position not stated), p. cclx, for *H. cardoni*, *subfasciatus*, n. spp., Bengal, p. cclxi; DESBROCHERS, C.R. Ent. Belg. xxxv.

*Hilipus longicollis*, Ecuador, OLLIFF, in Whymper Supp. App. p. 74, n. sp.

*Hipporhinus bertineæ*, *coronatus*, Transvaal, FAUST, S. E. Z. 1891, p. 385, n. spp.

*Hylobius*: table of characters of the European species; REITTER, p. 97, Wien. ent. Z. x.

*H. huguenini*, Switzerland, REITTER, t. c.; *H. consimilis*, p. 277, *angustus*, p. 278, E. India, FAUST, S. E. Z. 1891, n. spp.

*Hypomeces guttulatus*, Bengal, DESBROCHERS, p. ccelv, C.R. Ent. Belg. xxxv, n. sp.

† *Hypoplagiatus*, n. g., near *Zygops*, for *H. pectoralis* (Lac.), n. sp., without locality; DESBROCHERS, p. 40, Ann. Ent. Belg. xxxv.

<sup>4</sup>*Ichthyopisthen*, n. g. (*Calandridæ*), p. 363, for *I. bimaculatum*, p. 365, *albolineatum*, *rufoclavatum*, p. 366, Gaboon, *convexicollis*, p. 367, Africa, n. spp., and including *deplanatum*, Roel., and *pygidiale*, Simp.; AURIVILLIUS, Cefv. Ak. Förh. 1891.

*Larinus cleoniformis*, Algeria, BEDEL, p. xxxviii, Bull. Soc. Ent. Fr. 1891; *L. fucatus*, Ordubad, FAUST, p. 399, Hor. Ent. Ross. xxv; *L. persicus*, Persia, STIERLIN, p. 327, MT. Schw. ent. Ges. viii; *L. abbreviatus*, p. 117, *exclusus*, p. 118, Djizak, FAUST, Deutsche e. Z. 1891 : n. spp.

<sup>4</sup>*Leptarthrus*, n. subg. of *Anthonomus*; DIETZ, p. 197, Tr. Am. Ent. Soc. xviii.

*Limnobaris koltzei*, Dalmatia, FAUST, p. 333, Deutsche e. Z. 1891, n. sp.

*Listroderes inconspicuus*, *punctatissimus*, Ecuador, OLLIFF, in Whympers Supp. App. p. 69, n. spp.

*Litorhynchus quadrimaculatus*, Buq., note on; FAUST, p. 287, S. E. Z. 1891.

*Lixus subulatus*, Chanskaja Stavka, *heydeni*, p. 401, *olivieri*, Schahrud, p. 402, *reitteri*, Araxes Valley, p. 403, FAUST, Hor. Ent. Ross. xxv; *L. excelsus*, Djizak, FAUST, p. 119, Deutsche e. Z. 1891; *L. jekeli*, *breviatus*, Senegal, DESBROCHERS, p. cccli, C.R. Ent. Belg. xxxv; *L. clathratus*, *conicus*, Bengal, DESBROCHERS, p. ccelviii, C.R. Ent. Belg. xxxv; *L. languidus*, p. 275, *pracuæ*, p. 276, E. India, FAUST, S. E. Z. 1891 : n. spp.

*Macrops celorum*, Ecuador, OLLIFF, in Whympers Supp. App. p. 72, n. sp.

*Macropterus verlorenii*, Sn., = (*Cercophorus floccosus*, Chev.); RITSEMA, p. 154, Notes Leyd. Mus. xiii.

*Macrorhoptus hispidus*, Arizona, DIETZ, p. 185, Tr. Am. Ent. Soc. xviii, n. sp.

<sup>4</sup>*Magdalinops*, n. g. *Anthonomini*, p. 183, for *M. vittipennis*, n. sp., California, p. 184; DIETZ, Tr. Am. Ent. Soc. xviii.

<sup>4</sup>*Maseorhynchus*, n. g., near *Epicerus*, p. 146, for *M. hondurensis*, n. sp., British Honduras, p. 147, pl. vi, fig. 12; SHARP, Biol. Centr. Am. Col. iv (3).

*Mechistocerus patruelis*, Sikkim, FAUST, p. 286, S. E. Z. 1891, n. sp.

*Megaproctes zanzibarinus*, E. Africa, DESBROCHERS, p. cceliii, C.R. Ent. Belg. xxxv; *M. bilineatus*, Bengal, *id.* p. ccelxi, *t. c.* : n. spp.

<sup>4</sup>*Menostoma*, n. g., near *Stigmatrachelus*, for *M. cardoni*, n. sp., Bengal; DESBROCHERS, p. ccelvi, C.R. Ent. Belg. xxxv.

*Mestorus crinitus*, pl. vi, fig. 13, *gracilis*, p. 148, Mexico, SHARP, Biol. Centr. Am. Col. iv (3), n. spp.

*Mononychus salviae* and *punctumalbum* are one species; BUYSSON, p. xciv, Bull. Soc. Ent. Fr. 1891.

*Myllocerus 11-pustulatus*, p. 266, *tenuicornis*, p. 267, *molaris*, p. 268, Nagpore, FAUST, S. E. Z. 1891; *M. bengalensis*, p. ccelvi, *hirsutus*, *brachyderoides*, *luctuosus*, p. ccelvii, Bengal, DESBROCHERS, C.R. Ent. Belg. xxxv : n. spp.

<sup>4</sup>*Nanops*, n. g. *Anthonomini*, p. 256, for *N. schwarzii*, n. sp., Florida, p. 257; DIETZ, Tr. Am. Ent. Soc. xviii.

*Nastus kraatzi*, Alai, FAUST, p. 390, Hor. Ent. Ross. xxv, n. sp.

*Naupactus segnipēs*, p. 65, *pauper*, *nigrans*, p. 66, *parvicollis*, p. 67, Ecuador, OLLIFF, in Whymper Supp. App.; *N. ortizi*, Gran Chaco, BLANCHARD, Mém. Soc. Zool. iv, p. 493; n. spp.

*Neocleonus lederi*, Armenia, FAUST, p. 398, Hor. Ent. Ross. xxv, n. sp.

↓ *Neomastix*, n. g., p. 254, *Anthonomini*, for *N. solidaginis*, *punctatulus*, n. spp., N. America, p. 255; DIETZ, Tr. Am. Ent. Soc. xviii.

*Omius mollicomus*, larva noticed; BRISCHKE, Schr. Ges. Danz. (2) vii, 3, p. 8.

*O. maxillosus*, Siebenburgen, PETRI, p. 21, Verh. Siebenb. Ver. xli, n. sp.

*Ommatolampus pictus*, Sumatra, ROELOFS, p. 115, pl. viii, fig. 4, Notes Leyd. Mus. xiii, n. sp.

*Omotemnus*, Chev., recharacterised; FAUST, Deutsche e. Z. 1891, p. 339.

*O. hauseri*, Java, p. 341, *carnifex*, China, p. 344, *fleutiauxi*, Saigon, p. 345, FAUST, Deutsche e. Z., 1891, n. spp.

*Ophryastes wickhami*, Arizona, p. 88, *latipennis*, pl. iv, fig. 2, *basalis*, p. 89, *bituberosus*, fig. 1, *ovipennis*, fig. 3, p. 90, Mexico, SHARP, Biol. Centr. Am. Col. iv (3), n. spp.

*Orchestes ilicis*, n. var. *nigripes*; FOWLER, Col. Brit. Isl. v, p. 259.

*O. distans*, Djizak, FAUST, p. 120, Deutsche e. Z. 1891; *O. armatus*, Pennsylvania, DIETZ, p. 268, Tr. Am. Ent. Soc. xviii; n. spp.

*Orthorrhinus cylindrirostris*, habits and metamorphoses; OLLIFF, pp. 278–281, pl. v, Agric. Gaz. N.S.W.

*Otidocephalus*? *spenicollis*, Ecuador, OLLIFF, in Whymper Supp. App. p. 77, n. sp.

*Otidognathus*, list of the species; RITSEMA, p. 149, Notes Leyd. Mus. xiii.

*Otiorynchus putoni*, Gap, STIERLIN, p. 143, Rev. d'Ent. x; *O. argentifer*, Greece, p. 269, *remote-granulatus*, Hungary, *O. (Tournieria) subsetulosus*, Siebenburgen, p. 270, *strix*, Greece, p. 271, STIERLIN, MT. Schw. ent. Ges. viii; *O. travnikanus*, *puncticollis*, p. 322, *argenteo-sparsus*, p. 323, Bosnia, *rosti*, Caucasus, p. 324, *O. (Timalphis) viridicomus*, Kar Alps, *O. (Arammichnus) calabrensis*, Calabria, p. 325, *id. t. c.*: n. spp.

*Oxyopisthen deplanatum*, Niam Niam, p. 116, *buttikoferi*, Liberia, p. 118, *vittatum*, Congo, p. 119, ROELOFS, Notes Leyd. Mus. xiii; *O. nitidum*, p. 168, *clavatum*, p. 169, *saturale*, p. 170, Gaboon, *id. t. c.*: n. spp.

*Oxyrhynchus grandis*, China, FAIRMAIRE, p. xxiv, C.R. Ent. Belg. xxxv, n. sp.

*Pachycerus latirostris*, Djizak, FAUST, p. 117, Deutsche e. Z. 1891, n. sp.

*Pandeteius argentatus*, Ecuador, OLLIFF, in Whymper Supp. App. p. 62, n. sp.

*Pantomorus parvulus*, p. 153, *longulus*, *picipes*, p. 151, *salvini*, pl. vi, fig. 17, *mollis*, p. 155, *fucialis*, *asperatus*, p. 156, *affinis*, p. 157, *sobrinus*, fig. 18, *subcinctus*, p. 158, *faber*, *dorsalis*, p. 159, *picturatus*, fig. 19, *circumcinctus*, fig. 20, p. 160, *uniformis*, fig. 21, *rufipes*, p. 161, *rudis*, fig. 22, *distans*, fig. 23, p. 162, *brevipes*, fig. 24, *annecteus*, p. 163, *albicans*, fig. 25, *viridicans*, p. 164, *strabo*, pl. vii, fig. 1, *femoratus*, fig. 2, p. 165, *robustus*, fig. 3, p. 166, Central America, SHARP, Biol. Centr. Am. Col. iv (3), n. spp.

†*Paranthonomus*, n. subg. of *Anthonomus*; DIETZ, p. 199, Tr. Am. Ent. Soc. xviii.

*Paratasis*, Chev., note on the genus; RITSEMA, p. 154, Notes Leyd. Mus. xiii.

*Peribrotus minor*, Central Africa, KOLBE, p. 35, S. E. Z. 1891, n. sp.

*Peritelus muricatus*, Chev., = (*olivieri*, Desb.), p. 154; systematic position of the species and *C. aquilus*, Chev., noticed, p. 155; BEDEL, L'Ab. xxvii.

*Phytoscaphus nepalensis*, *lineatus*, *himalayanus*, E. India, FAUST, p. 274, S. E. Z. 1891, n. spp.

*Pissodes notatus*, metamorphoses; DECAUX, Le Nat. 1891, p. 109.

*Polycleis squamuliventris*, E. Africa, QUEDENFELDT, p. 169, B. E. Z. xxxvi, n. sp.

*Polydrosus* (*Eustolus*) *turanensis*, p. 388, *alaiensis*, p. 389, Alai, FAUST, Hor. Ent. Ross. xxv, n. spp.

*Protocerus*, list of the species of; RITSEMA, p. 150, Notes Leyd. Mus. xiii.

✓*Pseudanthonomus*, n. g. (*Anthonomini*), p. 248, for *P. validus*, *incipiens*, p. 250, *seriesetosus*, *tomentosulus*, p. 251; *facetus*, *longulus*, *rufulus*, p. 252, *brunneus*, *parvulus*, p. 253, *relictus*, p. 254, n. spp., N. America, including also *Anthonomus cratægi*, Walsh; DIETZ, Tr. Am. Ent. Soc. xviii.

*Pseudelissa*, characters and position discussed; SHARP, p. 151, Biol. Centr. Am. Col. iv (3).

*P. caseyi*, Mexico, SHARP, p. 151, pl. vi, fig. 16, Biol. Centr. Am. Col. iv (3), n. sp.

*Ptochus latirostris*, Tschimkent, FAUST, p. 115, Deutsche e. Z. 1891, n. sp.

†*Pycnophilus*, n. g., near *Pantomorus*, p. 166, for *P. piceus*, n. sp., Costa Rica, pl. vii, fig. 4, p. 167, SHARP, Biol. Centr. Am. Col. iv (3).

*Rhinochenus fimbriatus*, Chev., larva described; DECAUX, p. clxxxvii, Bull. Soc. Ent. Fr. 1891.

*Rhynchites æquatus*, metamorphoses; BUDDEBERG, p. 11, JB. nass. Ver. xlv.

*R. lenæus*, Caucasus, FAUST, Hor. Ent. Ross. xxv, n. sp.

*Rhynchophorus swierstræ*, Java, RITSEMA, Notes Leyd. Mus. xiii, n. sp.

✓*Roelofsia*, n. g., for *Cyrtotrachelus buquetii* and *dux*; RITSEMA, p. 148, Notes Leyd. Mus. xiii.

✓*Sciorhinus*, n. g., near *Epicærus*, for *S. pictus*, n. sp., Mexico, pl. vi, fig. 8, SHARP, p. 142, Biol. Centr. Am. Col. iv (3).

*Scleropterus* (*Rhytidossoma*) *ganglbaueri*, Cirbitzkogel, REITTER, p. 261, Wien. ent. Z. x, n. sp.

*Sharpia deserticola*, Transcasian region, FAUST, p. 405, Hor. Ent. Ross. xxv; *S. globulicollis*, p. 119, *ibis*, p. 120, Djizak, FAUST, Deutsche e. Z. 1891; *S. bella*, Nagpore, FAUST, p. 281, S. E. Z. 1891: n. spp.

*Sibiria harmonica*, Chev., = (*nigrovittata*, Desb.); BEDEL, p. 155, L'Ab. xxvii.

*S. pusilla*, Djizak, FAUST, p. 121, Deutsche e. Z. 1891, n. sp.

\**Sitophilus decauxi*, Siam, DECAUX, (175, p. 14), n. sp.

- Smicronyx reichei*, n. var. *championis*; FOWLER, Col. Brit. Isl. v, p. 283.
- S. albo-variegatus*, p. 280, *centropustulatus*, p. 281, Nagpore, FAUST, S. E. Z. 1891, n. spp.
- Solobrachis*, n. g. (position not stated), for *S. acalloides*, n. sp., Bengal; DESBROCHERS, p. ccclx, C.R. Ent. Belg. xxxv.
- Sphenophorus minimus*, Hart, redescribed; HAMILTON, Ent. News, ii, p. 113.
- S. notandus*, ECUADOR, OLLIFF, in Whympers Supp. App. p. 79, n. sp.
- Stenophida trilineata*, Gaboon, AURIVILLIUS, p. 370, Cefv. Ak. Förh. 1891, n. sp.
- Stephanocleonus trifasciatus*, Minussinsk, FAUST, p. 397, Hor. Ent. Ross. xxv, n. sp.
- Stigmatrachelus aurosarsus*, Trop. Africa, FAIRMAIRE, p. 267, Ann. Soc. Ent. Fr. 1891, n. sp.
- Strophomorphus persicus*, Schahrud, FAUST, p. 389, Hor. Ent. Ross. xxv, n. sp.
- Strophosomus flachi*, Switzerland, STIERLIN, p. 326, MT. Schw. ent. Ges. viii, n. sp.
- Systates corinthius*, Trop. Africa, FAIRMAIRE, p. 266, Ann. Soc. Ent. Fr. 1891, n. sp.
- Tachypterus*, n. g., p. 186, *Anthonomini*, for *A. quadrigibbus*, Say, and *T. consors*, n. sp., Oregon, p. 187; DIETZ, Tr. Am. Ent. Soc. xviii.
- Tanymecus subaureus*, *parvus*, *hercules*, *penicillatus*, E. Indies, DESBROCHERS, p. ccclv, C.R. Ent. Belg. xxxv, n. spp.
- Tuphrorhynchus assamensis*, Sikkim, FAUST, p. 260, S. E. Z. 1891, n. sp.
- Tosastes*, n. g., near *Ophryastes*, for *T. humeralis*, pl. iv, fig. 4, *globipennis*, fig. 5, n. spp., Mexico, SHARP, p. 91, Biol. Centr. Am. Col. iv (3).
- Trachodius*, n. subg. of *Acalles*, for *Trachodius tibialis*, n. sp., Macugnaga; WEISE, Deutsche e. Z. 1891, p. 122.
- Trichobaropsis*, n. subg. of *Anthonomus*; DIETZ, p. 196, Tr. Am. Ent. Soc. xviii.
- Tychius tibialis*, var., = (*oomptus*, Tourn.); BEDEL, p. 155, L'Ab. xxvii.
- T. molestus*, Turkestan, *facetus*, Siberia, FAUST, p. 407, Hor. Ent. Ross. xxv, n. spp.
- Xanthus*, n. g. *Anthonomini*, for *X. pygmaeus*, p. 269, *liliputanus*, p. 270, n. spp., N. America; DIETZ, Tr. Am. Ent. Soc. xviii.
- Zygops*: the nomenclature of the species of Dejean's collection; DESBROCHERS, pp. 38 & 39, Ann. Ent. Belg. xxxv. *Z. buffo* = (*hieroglyphica*, Er., and *ochatina*, Boh.); *tridentata* = (*hinnula*, Boh.); *semialba*, Er., = (*albicollis*, Boh.); *histrion* var. = (*submaculatus*, Boh.); *id. t. c.* pp. 41 & 42.
- Z. leucogaster*, Cayenne, *vitticollis*, Mexico, p. 39, *impressiventris*, *maculipes*, Cayenne, *Z. (Aptorhynchus) leopardinus*, Mexico, p. 10, DESBROCHERS, Ann. Ent. Belg. xxxv, n. spp.

## SCOLYTIDÆ.

[Cf. BLANDFORD (81), DUVIVIER (221), FAIRMAIRE (254), LEPRIEUR (521), MÜHL (605), REITTER (694, 698), SCHAUFUSS (768), SCHWARZ (778).]

Translation into French of EICHHOFF'S "Europäischen Borkenkäfer," by LEPRIEUR, L'Ab. xxvii.

*Cnesinus strigicollis*, habits ; SCHWARZ, P. E. Soc. Wash. ii, p. 79.

\**Coccotrypes laboulbenei*, Siam, DECAUX (175) [according to BEDEL, L'Ab. xxvii, p. 155, this is *C. dactyliperda*, Fab.), n. sp.

†*Cryphalomorphus*, n. g. for *C. communis*, n. sp., Madagascar, SCHAUFUSS, p. 12, Tijdschr. Ent. xxxiv.

*Crossotarsus chapuisi*, Congo, DUVIVIER, p. cccxxvii, C.R. Ent. Belg. xxxv, n. sp.

*Eccoptoptera labrata*, Mozambique, FAIRMAIRE, p. 231, Ann. Soc. Ent. Fr. 1891, n. sp.

*Hylurgus piniperda*, notes on ; ORMEROD, Rep. 1890, p. 113.

*H. amœnus*, Madagascar, SCHAUFUSS, p. 10, Tijdschr. Ent. xxxiv, n. sp.

*Liparthrum bartschli*, Austria, MÜHL, Wien. ent. Z. x, p. 202, n. sp.

*Phleophthorus rhododactylus*, Marsh., = (*spartii*, Nörtl.) ; BLANDFORD, p. 213, Wien. ent. Z. x.

*P. chapuisii*, n. n. for *rhododactylus*, Ratz., nec Marsh. ; BLANDFORD, Wien. ent. Z. x, p. 213, also *P. chapuisii*, n. n. for *rhododactylus*, Ratz., nec Marsh. ; BLANDFORD, in Fowler Col. Brit. Isl. v, p. 468.

*Phleotribus caucasicus*, Ordubad, REITTER, p. 32, Deutsche e. Z. 1891, n. sp.

*Pityophthorus* : descriptions of the British species ; *P. pubescens*, Marsham, = (*ramulorum*, Per.) ; BLANDFORD, Ent. M. M. (2) ii, pp. 15-17.

*P. deprecator*, p. 15. *obtus*, p. 17, SCHAUFUSS, Tijdschr. Ent. xxxiv, n. spp.

*Platypus congoanus*, W. Africa, DUVIVIER, p. cccxlxiii, C.R. Ent. Belg. xxxv, n. sp.

‡*Scolytoplatypus*, n. g., for *S. permirus*, n. sp., Madagascar, SCHAUFUSS, p. 31, Tijdschr. Ent. xxxiv.

*Scolytus rugulosus* in N. America, habits and metamorphosis ; FORBES, Rep. xvii, pp. 1-20, pl. i.

*Stephanoderes communis*, Madagascar, SCHAUFUSS, p. 11, Tijdschr. Ent. xxxiv, n. sp.

*Thamnurgus exul*, Turcomania, REITTER, p. 199, Wien. Ent. Z. x, n. sp.

*Xyleborus fuscatus*, *pubescens*, habits ; SCHWARZ, P. E. Soc. Wash. ii, p. 78. *X. tuchygraphus* and *dispar* : food-habits ; SCHWARZ, P. E. Soc. Wash. ii, pp. 62-64.

*X. cornutus*, p. 17, *natalensis*, p. 20, *neptunus*, p. 22, *madagascariensis*, p. 23, *eichhoffi*, p. 25, *spinosus*, p. 27, *spiculatus*, p. 28, *armatus*, p. 30, Madagascar, SCHAUFUSS, Tijdschr. Ent. xxxiv, n. spp.

*Xyloterus politus* : habits ; SCHWARZ, P. E. Soc. Wash. ii, p. 77.

## BRENTHIDÆ.

[*Cf.* DESBROCHERS (179), OLLIFF (963), SENNA (802).]

*Achrionota bilineata*, Pasc., ♀ described; SENNA, p. 163, Notes Leyd. Mus. xiii.

*Brenthus vulneratus*, Gyll., figured in Whymper Supp. App. p. 81.

*Miolispa maria*, Penang, SENNA, p. 165, Notes Leyd. Mus. xiii, n. sp.

*Orychodes ritsemæ*, Malacca, SENNA, p. 161, Notes Leyd. Mus. xiii, n. sp.

*Prophthalmus planipennis*, Pasc., ♀ described; SENNA, p. 164, Notes Leyd. Mus. xiii.

## ANTHOTRIBIDÆ.

[*Cf.* GUILLEBEAU (358), LESNE (523), REITTER (703), SHARP (804).]

*Acorynus* merged in *Tropidæres*; SHARP, p. 301, Tr. E. Soc. 1891.

*Anthribus duimio*, Japan, SHARP, p. 319, Tr. E. Soc. 1891, n. sp.

*Apolecta lewisii*, Japan, SHARP, p. 318, Tr. E. Soc. 1891, n. sp.

*Araocerus tarsalis*, Japan, SHARP, p. 323, Tr. E. Soc. 1891, n. sp.

↓ *Asemorhinus*, n. g. *Tophoderides*, p. 298, for *A. nebulosus*, n. sp., Japan, p. 299; SHARP, Tr. E. Soc. 1891.

*Basitropis dispar*, Japan, SHARP, p. 320, Tr. E. Soc. 1891, n. sp.

↓ *Blabirhinus*, n. g., *Tophoderides*, p. 299, for *B. dorsalis*, n. sp., Japan, p. 300; SHARP, Tr. E. Soc. 1891.

*Brachytarsus varius* feeding on *Coccus racemosus*; STIERLIN, p. 291, MT. Schw. ent. Ges. viii.

↓ *Caccorhinus*, n. g., near *Basitropis*, for *C. oculatus*, n. sp., Japan; SHARP, p. 321, Tr. E. Soc. 1891.

*Choragus compactus*, p. 323, *cryptocephalus*, *mundulus*, p. 324, *anobioides*, *cissoides*, *cryphaloides*, p. 325, Japan, SHARP, Tr. E. Soc. 1891, n. spp.

↓ *Deropygus*, n. g., near *Araocerus*, for *D. histrio*, p. 326, *jocosus*, p. 327, n. spp., Japan; SHARP, Tr. E. Soc. 1891.

*Doticus*, Pasc., = (*Metadoticus*, Oll.); OLLIFF, p. 288, Agric. Gaz. N.S.W. i.

*Eugigas harmandi*, Cochin China, LESNE, p. xci, Bull. Soc. Ent. Fr. 1891, n. sp.

*Litocerus* merged in *Tropidæres*; SHARP, p. 301, Tr. E. Soc. 1891.

*L. paviei*, Siam, LESNE, p. xci, Bull. Soc. Ent. Fr. 1891, n. sp.

*Notioxenus wollastoni*, p. 327, *tomicoides*, p. 328, Japan, SHARP, Tr. E. Soc. 1891, n. spp.

*Ozotomerus japonicus*, Japan, SHARP, p. 320, Tr. E. Soc. 1891, n. sp.

*Phenotherion fasciculatum*, Italy, REITTER, p. 248, Wien. ent. Z. x, n. sp.

*Phleobius mimes*, Japan, SHARP, p. 319, Tr. E. Soc. 1891, n. sp.

*Tropidæres fuscipennis*, France, GUILLEBEAU, p. 199, Rev. d'Ent. x, n. sp.

*T. rugirostris*, p. 302, *latirostris*, p. 303, *laxus*, *germanus*, p. 304, *vilis*, *flabellicornis*, p. 305, *crassicornis*, p. 306, *brevirostris*, p. 307, *nodulosus*,



*incisus*, p. 308, *aberrans*, *confinis*, p. 309, *distinguendus*, *basipennis*, p. 310, *debilis*, *cylindricus*, p. 311, *longipes*, p. 312, *pardalis*, p. 313, *guttifer*, *concolor*, p. 314, *pectoralis*, *truncatus*, p. 315, *bruchoides*, *imperfectus*, p. 316, *difficilis*, p. 317, SHARP, Tr. E. Soc. 1891, n. spp.

✓ *Ulorhinus*, n. g. *Tropiderides*, p. 300, for *U. funebris*, n. sp., Japan, p. 301; SHARP, Tr. E. Soc. 1891.

*Xylinades japonicus*, Japan, SHARP, p. 317, Tr. E. Soc. 1891, n. sp.

## BRUCHIDÆ.

*Mylabris venusta*, notes on; BAUDI, Nat. Sicil. x, p. 168. *M. venusta* and *arachidis*, Fahrs., notes on; *id.* p. 251, Deutsche e. Z. 1891.

## CERAMBYCIDÆ.

[Cf. BATES (34, 35, 40, 963), BELON (50), BLACKBURN (73, 75), CZWALINA (172), DUVIVIER (221), FABRE (252), FAIRMAIRE (254, 259, 262), GAHAN (312), GANGLBAUER (315, 317), KANNEGIETER (444), KOLBE (479), NONFRIED (624), PIC (650, 651, 652, 653, 654, 655), QUEDENFELDT (670), REITTER (692, 694), SEMENOW (797), THÉRY (857).]

Habits of various larvæ noticed; FABRE, Souvenirs, iv, chap. xviii.

*Æolesthes holosericeus*, Fab., synonymy and characters of type noticed; GAHAN, Ann. N. H. (6) vii, p. 20.

*Agapanthia reyi*, note on its specific distinctions; ARGOD-VALLON, p. xxxviii, Bull. Soc. Ent. Fr. 1891.

*Agnia pulchra*, Manilla, AURIVILLIUS, p. 104, Ent. Tidskr. xii, n. sp.

*Anatisis frenchi*, Queensland, BLACKBURN, p. 789, P. Linn. Soc. N.S.W. (2) v, n. sp.

*Anoplostetha diversiventris*, Guinea, FAIRMAIRE, p. 270, Ann. Soc. Ent. Fr. 1891, n. sp.

*Anybostetha wahlbergi*, Lake N'Gami, AURIVILLIUS, p. 105, Ent. Tidskr. xii, n. sp.

*Apterocaulus durnfordi*, Burm., ♂ ♀ figured; Mem. Soc. Zool. iv, pl. iv, figs. 8 & 9.

✓ *Argodia*, n. g. *Apodasyides*, for *A. grouvellci*, n. sp., Mexico; BELON, p. liv, Bull. Soc. Ent. Fr. 1891.

*Atossa bipartita*, figured, pl. x, fig. 6; Notes Leyd. Mus. xiii.

*Batocera diana*, Thibet, NONFRIED, p. 276, Deutsche e. Z. 1891, n. sp.

*Belodera apicalis*, E. Africa, FAIRMAIRE, C.R. Ent. Belg. xxxv, p. cccii, n. sp.

*Brachyta bifasciata*, n. var. *caucasica*; ROST, Deutsche e. Z. 1891, p. 309.

*Callichroma distincta*, Cochin China, NONFRIED, p. 275, Deutsche e. Z. 1891, n. sp.

*Cantharocnemis plicipennis*, *variolosus*, figured, pl. v, noticed, p. 269; FAIRMAIRE, Ann. Soc. Ent. Fr. 1891.

*Cartodera confusa*, Schalbus-Dagh, REITTER, p. 34, Wien. ent. Z. x, n. sp.

*Cerambyx*: table of characters of the species; CZWALINA, Wien. ent. Z. x, p. 99. *C. miles*, *cerdo*, habits and instinct of larvæ; FABRE, Souvenirs, chaps. xvii & xviii.

*C. centurio*, Syria, CZWALINA, p. 100, Wien. ent. Z. x, n. sp.

*Ceresium albopubens*, Seychelles, FAIRMAIRE, p. clxxxii, Bull. Soc. Ent. Fr. 1891, n. sp.

*Ceroplesis latevittata*, *griseotincta*, E. Africa, FAIRMAIRE, p. ccc, C.R. Ent. Belg. xxxv, n. spp.

*Clytus arietis*, pupa noticed; VERHOEFF, p. 2, Verh. Ver. Rheinl. xlviii. *C. (Clytanthus) massiliensis* and allies, characters of; PIC, pp. 144-147, Rev. d'Ent. x.

*C. (Clytanthus) incertus*, Spain? PIC, p. 237, Feuille. Nat. xxi (n. sp. ?); *C. (Xylotrechus) sieversi*, Russian Armenia, GANGLBAUER, p. 429, Hor. Ent. Ross. xxv: n. spp.

*Cœlodon?* *prionoides*, Damaraland, AURIVILLIUS, Ent. Tidskr. xii, pp. 97 & 98.

*Cortodera semilivida*, Syria, PIC, p. exciii, Bull. Soc. Ent. Fr. 1891; (*vide Cortodera*, *suprà*): n. spp.

† *Cosmoplatus*, n. g. *Paristemiidae*, p. 101, for *C. peruvianus*, n. sp., Upper Amazons, p. 102; AURIVILLIUS, Ent. Tidskr. xii.

*Deltaspis disparilis*, *marginella*, p. 160, *variabilis*, p. 161, Mexico, BATES, Ent. M. M. (2) ii, n. spp.

*Derobrachus kuverti*, Honduras, NONFRIED, p. 273, Deutsche e. Z. 1891, n. sp.

† *Derolus*, n. subg. of *Pachydissus*; GAHAN, p. 26, Ann. N. H. (6) vii, n. sp.

*Dialeges undulatus*, E. India, GAHAN, p. 23, Ann. N. H. (6) vii, n. sp.

*Dichostathes tubericollis*, Senegal, FAIRMAIRE, p. 271, Ann. Soc. Ent. Fr. 1891; *D. brunneopictus*, E. Africa, FAIRMAIRE, p. cccxcix, C.R. Ent. Belg. xxxv, n. sp.

↓ *Diorthus*, n. subg. of *Pachydissus*; GAHAN, Ann. N. H. (6) vii, p. 27.

† *Djabiria*, n. g., near *Plocederus*, for *D. geniculata*, n. sp., Congo; DUVIVIER, p. ccclxxviii, C.R. Ent. Belg. xxxv.

*Dorcadion læve*, Fald., and *talyschense*, Ganglb., distinctive characters; HELLER, Deutsche e. Z. 1891, p. 307, and Ent. Nachr. xvii, p. 193.

*D. beloni*, Siberia, PIC, p. lxxvii, Bull. Soc. Ent. Fr. 1891, n. sp.

*Dymasius* and allies, characters of; GAHAN, p. 22, Ann. N. H. (6) vii.

*D. (Elydnus) pascoei*, n. n. for *D. strigosus*, Pasc., *nec* Th.; GAHAN, Ann. N. H. (6) vii, p. 23.

*Ephies sulcipennis*, E. India, BATES, p. 22, Ent. xxiv, Supp., n. sp.

*Ergates spiculatus*, Lec., = (*neomexicanus*, Casey); HORN, p. 41, Tr. Am. Ent. Soc. xviii.

*Esmeralda costulata*, Amazons, BATES, Ent. M. M. (2) ii, p. 158, n. sp.

*Eucharassus?* *nisseri*, Colombia, AURIVILLIUS, p. 100, Ent. Tidskr. xii, n. sp.

*Eumimetes tropicus*, Congo, DUVIVIER, p. ccccx, C.R. Ent. Belg. xxxv, n. sp.

- Euporus itimbirensis*, Congo, DUVIVIER, p. ccelxxviii, C.R. Ent. Belg. xxxv, n. sp.
- Eurybatus inexpectatus*, figured, pl. x, fig. 4, Notes Leyd. Mus. xiii.
- Eurysthea angusticollis*, Ecuador, BATES, in Whympers Supp. App. p. 37, n. sp.
- Exocentrus variegatus*, Congo, DUVIVIER, p. ccccxix, C.R. Ent. Belg. xxxv, n. sp.
- Frea subcostata*, Central Africa, KOLBE, S. E. Z. 1891, p. 35, n. sp.
- Gnathæna bialbata*, Gaboon, FAIRMAIRE, p. 270, Ann. Soc. Ent. Fr. 1891, n. sp.
- Gnatholea denticollis*, Zanzibar, FAIRMAIRE, p. 269, Ann. Soc. Ent. Fr. 1891, n. sp.
- Haplopsebium*, n. g., near *Psebium*, for *H. nigricorne*, n. sp., Gaboon ; AURIVILLIUS, p. 99, Ent. Tidskr. xii.
- Imbrius? mandibularis*, Penang, GAHAN, Ann. N. H. (6) vii, p. 21, n. sp.
- Lachnopterus socius*, Philippine Is., GAHAN, Ann. N. H. (6) vii, p. 24, n. sp.
- Lasiopezus josephus*, Congo, DUVIVIER, p. ccelxxx, C.R. Ent. Belg. xxxv; *L. exiguus* E. Africa, QUEDENFELDT, p. 170, B. E. Z. xxxv : n. spp.
- Leprodera congoana*, W. Africa, DUVIVIER, p. ccelxxix, C.R. Ent. Belg. xxxv, n. sp.
- Leptura grammopteroïdes*, Lebanon, PIC, p. clxxxv, Bull. Soc. Ent. Fr. 1891 ; *L. nobilitata*, Madagascar, NONFRIED, p. 274, Deutsche e. Z. 1891 : n. spp.
- Letzneria lineata*, n. var. *weisi*, HEYDEN, p. 389, Deutsche e. Z. 1891.
- Margites*, n. subg. of *Pachydissus* ; GAHAN, p. 26, Ann. N. H. (6) vii.
- Marmylaris buckleyi*, Pasc. : note and figure ; AURIVILLIUS, p. 106, Ent. Tidskr. xii.
- Mecaspis tuberculicollis*, E. Africa, QUEDENFELDT, p. 169, B. E. Z. xxxvi, n. sp.
- Monohammus parendeli*, Algeria, THÉRY, p. xxiii, Bull. Soc. Ent. Fr. 1891 ; *M. lunifer*, W. Africa, AURIVILLIUS, p. 103, Ent. Tidskr. xii ; *M. centralis*, DUVIVIER, C.R. Ent. Belg. xxxv, p. ccelxxx ; *M. millegranus*, Sze-chuen, BATES, Ent. xxiv, Supp. p. 80 : n. spp.
- Mystacophorus*, n. g. *Tetraopides*, for *M. mystax*, n. sp., Congo ; DUVIVIER, p. ccccxix, C.R. Ent. Belg. xxxv.
- Necydalis minima*: habits of larva ; VERHOEFF, p. 2, Verh. Ver. Rheinl. xlviii.
- Neocerambyx grandis*, W. India, GAHAN, Ann. N. H. (6) vii, p. 20 ; *N. indicola*, E. India, BATES, p. 21, Ent. xxiv, Supp. : n. spp.
- Neopharsalia vagans*, Java, KANNEGIETER, p. 189, Notes Leyd. Mus. xiii, n. sp.
- Noëmia apicicornis*, figured, pl. x, fig. 3, Notes Leyd. Mus. xiii.
- Nupserha apicata*, E. Africa, FAIRMAIRE, p. ccci, C.R. Ent. Belg. xxxv, n. sp.

*Ocheutes spinicollis*, E. India, BATES, p. 22, Ent. xxiv, Supp., n. sp.

*Ceax lichenea*, Congo, DUVIVIER, p. ccccx, C.R. Ent. Belg. xxxv, n. sp.

*Ozodera callidioides*, ♂ described and figured; AURIVILLIUS, Ent. Tidskr. xii, p. 102, fig. 3.

*Pachydissus* revised, and new subgenera proposed; GAHAN, Ann. N. H. (6) vii, pp. 24-32. [Cf. *Derolus*, *Diorthus*, *Margites*.]

*P. brevicornis*, p. 27, *rugosicollis*, p. 28, *intermedius*, Australia, *parvicollis*, N. India, p. 29, *P. (Margites) humilis*, *P. (Derolus) arciferus*, Senegal, p. 30, *P. (Diorthus) vagus*, Senegal?, p. 32, GAHAN, Ann. N. H. (6) vii, n. spp.

*Phacodes validus*, Queensland, p. 342, *bellus*, N. S. Wales, p. 343, *marmoratus*, Australia, p. 344, BLACKBURN, Tr. R. Soc. S. Austr. xiv, n. spp.

*Phryneta*, n. g., near *Phryneta*, p. cccclxxx, for *P. quadrimaculatus*, n. sp., Congo, p. cccclxxxi, DUVIVIER, C.R. Ent. Belg. xxxv.

*Phytæcia punctum*, var. *grisea*; PIC, Feuille. Nat. xxi, p. 139. *P. turki*, n. var. *griseicornis*; id. p. clxxxvii, Bull. Soc. Ent. Fr. 1891. *P. (Musaria) perrini*, Lebanon, id. p. clxxxvi, t. c.

*P. ludovici*, Sarepta, PIC, p. cxxxv, Bull. Soc. Ent. Fr. 1891; *P. (Coptosia) eylancti*, Transcaspian region, SEMENOW, p. 330, Hor. Ent. Ross, xxv; *P. (Conizonia) fulvolineata*, Ordubad, REITTER, p. 33, Deutsche e. Z. 1891: n. spp.

*Plocederus ferrugineus*, L., = (*Lamia umbrina*, Dalm.); GAHAN, Ann. N. H. (6) vii, p. 20.

*P. tenuis*, Congo, DUVIVIER, C.R. Ent. Belg. xxxv, p. cccclxxvii, n. sp.

*Pogonochærus eugenie*, Austria, p. 131, *caucasicus*, Borshom, p. 132, GANGLBAUER, Wien. ent. Z. x, n. spp.

*Prionocalus whympersi*, p. 36, *trigonodes*, p. 37, Ecuador, BATES, in Whympers Supp. App., n. spp.

*Prionus coriarius*: metamorphoses; PLANET, Le Nat. 1891, p. 32, woodcuts.

*Pronocera pilosa*, Taschkent, REITTER, p. 33, Deutsche e. Z. 1891, n. sp.

*Prosopocera signatifrons*, Congo, DUVIVIER, p. cccclxxxi, C.R. Ent. Belg. xxxv; *P. inermis*, S. Africa, AURIVILLIUS, p. 104, Ent. Tidskr. xii: n. spp.

*Prospophilus* (sub *Lamia*) *serricornis*, Dalm., is omitted from the Munich Catalogue, and = (*pilosicollis*, Th.); GAHAN, Ann. N. H. (6) vii, p. 19.

*Purpuricenus deyrollei*, n. var. *talyschensis*; REITTER, p. 240, Wien. ent. Z. x.

*Pyrodes maculicollis*, Mexico, BATES, Ent. M. M. (2) ii, p. 158, n. sp.

*Rhytidodera robusta*, Bombay, GAHAN, p. 34, Ann. N. H. (6) vii, n. sp.

*Sternotomis callais*, Congo, FAIRMAIRE, p. 271, Ann. Soc. Ent. Fr. 1891, n. sp.

*Sthenias puncticornis*, E. Africa, FAIRMAIRE, p. cccci, C.R. Ent. Belg. xxxv; *S. minor*, Congo, DUVIVIER, p. cccclxxxi, t. c.: n. spp.

*Thermonotus pasteuri*, figured, pl. x, fig. 5 ; Notes Leyd. Mus. xiii.

*Toxotus vittatus*, Fisch., is probably distinct from *tataricus*, Gebl. ; HELLER, p. 62, Wien. ent. Z. x.

*Trachyderes vermiculatus*, Ecuador, BATES, in Whymper Supp. App. p. 38, n. sp.

*Vadonia livida*, n. var. *desbrochersi* ; PIC, p. xvi, Bull. Soc. Ent. Fr. 1891.

*Velleda aberrans*, Congo, DUVIVIER, p. cccclxxix, C.R. Ent. Belg. xxxv, n. sp.

✓ *Vesperoctenus*, n. g., near *Vesperus*, p. 159, for *V. fohri*, n. sp., Mexico, p. 160 ; BATES, Ent. M. M. (2) ii.

*Xiphothecta saundersi*, Pasc., = (*Bubalotragus möllendorffii*, Flach) ; POLL, p. 232, Wien. ent. Z. x.

*Xoanodera laticornis*, Sarawak, p. 32, *X. ? vitticollis*, p. 33, Borneo, GAHAN, Ann. N. H. (6) vii, n. spp.

*Xylotrechus pantherinus*, Gebl., notes on ; HEYDEN, Wien. ent. Z. x, pp. 181-184, and MÜHL, t. c. p. 185.

*X. gahani*, Congo, DUVIVIER, p. cccclxxix, C.R. Ent. Belg. xxxv, n. sp.

*Zonopterus redemanni*, Ceylon, NONFRIED, p. 274, Deutsche e. Z. 1891, n. sp.

#### CHRYSOMELIDÆ.

[Cf. BEDEL (46), BLACKBURN (74), BRISOUT (97), DEMAISON (176), DUVIVIER (221, 222), EDWARDS (232), FAIRMAIRE (254, 258, 259, 260), GAHAN (309, 310, 311, 313), GARMAN (321), GIACOSA (326), GORHAM 33 (963), GUILLEBEAU (359), JACOBY (337, 434, 435, 436, 963), KOLBE (479), LEFÈVRE (516, 517, 518, 519), LENG (520), REITTER (694), SEMENOW (797), WEISE (950, 952, 953, 955).]

Resemblances between *Lema* and *Diabrotica* described and figured ; GAHAN, Tr. F. Soc. 1891, pp. 367, &c.

BEDEL commences the *Chrysomelide* in his Faune du bassin de la Seine, v, pp. 105-136.

*Abirus andamansis*, Andaman Is., LEFÈVRE, p. cclxix, C.R. Ent. Belg. xxxv, n. sp.

✓ *Acanthonycha*, n. g., for *Pelonia elegantula* ; JACOBY, p. 278, Biol. Centr. Am. Col. vi (1) Supp.

*Agelasa fulvicollis*, E. Africa, QUEDENFELDT, p. 174, B. E. Z. xxxvi, n. sp.

*Agetocera birmanica*, Burma, JACOBY, Ent. xxiv, Supp. p. 63, n. sp.

✓ *Alaotra*, n. g. *Luperites*, for *A. bipunctata*, n. sp., Madagascar ; DUVIVIER, p. cccxviii, C.R. Ent. Belg. xxxv.

*Alethaxius (Alates) nigratarsis*, Ecuador, JACOBY, in Whymper Supp. App. p. 83, n. sp.

*Alphidia magnifica*, Madagascar, DUVIVIER, p. ccxliii, C.R. Ent. Belg. xxxv, n. sp.

*Antipha abdominalis*, var., = (*nigra*, All.) ; JACOBY, Ent. xxiv, Supp. p. 38.

*A. indica*, Sikkim, DUVIVIER, p. clvi, C.R. Ent. Belg. xxxv ; *A. hirsuta*, p. 32, *dimidiaticornis*, *subcaerulea*, p. 33, E. India, JACOBY, Ent. xxiv, Supp. ; *A. quadrimaculata*, Java, *id. t. c.* p. 63 ; *A. ornata*, Java, *impressicollis*, Thibet, *id. t. c.* pp. 38 & 63 : n. spp.

† *Antsianaka*, n. g., of isolated position, p. cexliv, for *A. pulchella*, n. sp., Madagascar ; DUVIVIER, C.R. Ent. Belg. xxxv.

*A. longicornis*, *rufipennis*, Madagascar, *id. p.* cccix, *t. c.*, n. spp.

*Aphthona ecuadoriensis*, Corazon, JACOBY, in Whympers Supp. App. p. 85 ; *A. pacifica*, p. 292, *pectoralis*, p. 293, *dimidiaticornis*, *femorata*, p. 294, *unicolor*, *castanea*, *smithi*, p. 295, *purpurea*, *amulensis*, *fulvitaris*, p. 296, *A. (?) crassicornis*, p. 297, Central America, JACOBY, Biol. Centr. Am. Col. vi (1) Supp. : n. spp.

*Apophyllia elegantula*, *nigritarsis*, S. Africa, JACOBY, Ent. xxiv, Supp. p. 39 ; *A. costipennis*, E. Africa, FAIRMAIRE, C.R. Ent. Belg. xxxv, p. ccciv : n. spp.

*Aracyntha haroldi*, Pernambuco, LEFÈVRE, p. cclvi, C.R. Ent. Belg. xxxv, n. sp.

*Argoa bahiensis*, Brazil, LEFÈVRE, p. 294, Ann. Soc. Ent. Fr. 1881, n. sp.

*Arescus parumpunctatus*, Ecuador, GORHAM, in Whympers Supp. App. p. 54, n. sp.

*Aspidolopha rugosa*, Sikkim, JACOBY, Ent. xxiv, Supp. p. 32 ; *A. sublevicollis*, *distincta*, E. India, DUVIVIER, p. xxxii, C.R. Ent. Belg. xxxv : n. spp.

*Aspidomorpha ingens*, Congo, DUVIVIER, p. ccccxii, C.R. Ent. Belg. xxxv, n. sp.

*Aulacophora sexpunctata*, *costatipennis*, *batesi*, notes on ; DUVIVIER, pp. cxlvi & cxlvii, C.R. Ent. Belg. xxxv. *A. quadrifusciata*, All., = (*Idacantha madagascariensis*, Jac.) ; ALLARD, p. cxxvii, Bull. Soc. Ent. Fr. 1891.

*A. pygidialis*, p. ccciv, *semipalliata*, p. cccv, E. Africa, FAIRMAIRE, C.R. Ent. Belg. xxxv ; *A. fruhstorferi*, p. cxlvii, *quinqueplagiata*, p. cxlviii, Java, DUVIVIER, C.R. Ent. Belg. xxxv : n. spp.

*Blepharida multiguttata*, Madagascar, DUVIVIER, p. cexlii, C.R. Ent. Belg. xxxv ; *B. alternata*, Mexico, JACOBY, pl. xlii, fig. 18, p. 306, Biol. Centr. Am. Col. vi (1) Supp. : n. spp.

*Cacoscelis varians*, p. 273, *nigripes*, p. 274, Central America, JACOBY, Biol. Centr. Am. Col. vi (1) Supp., n. spp.

*Calligrapha fulvitaris*, Panama, pl. xli, fig. 3, p. 245, *femorata*, fig. 4, *marginipennis*, fig. 5, Mexico, p. 247, JACOBY, Biol. Centr. Am. Col. vi (1) Supp., n. spp.

† *Calliphron*, n. g., near *Plectrotetra*, for *C. ferrugineum*, n. sp., Panama, pl. xlii, fig. 5 ; JACOBY, p. 278, Biol. Centr. Am. Col. vi (1) Supp.

*Callispa kilimana*, W. Central Africa, KOLBE, p. 28, S. E. Z. 1891, n. sp.

*Calomicrus apicalis*, Syria, DEMAISON, p. exciv, Bull. Soc. Ent. Fr. 1891, n. sp.

*Camptolenes fairmairei*, Obock, LEFÈVRE, p. cexlviii, C.R. Ent. Belg. xxxv, n. sp.

✓*Candezoides*, n. g., near *Candezea*, for *C. hova*, n. sp., Madagascar ; DUVIVIER, p. ccxliv, C.R. Ent. Belg. xxxv.

*Cassida*: notes on Desbrochers' monograph of the French species ; WEISE, Deutsche e. Z. 1891, pp. 380-384. *C. tunisiensis*, Boh., =(*kœchlini*, Mars., and *biskrensis*, Desb.) ; BEDEL, p. 156, L'Ab. xxvii. *C. suberosa*, n. var. *discoidalis* ; REITTER, p. 35, Deutsche e. Z. 1891.

*C. augustifrons*, *hyalina*, Spain, *rhilensis*, Bulgaria, *tincta*, Austria, WEISE, p. 205, Wien. ent. Z. x ; *C. dorsata*, E. India, DUVIVIER, p. l, C.R. Ent. Belg. xxxv : n. spp.

✓*Cassidula*, n. subg. of *Cassida* ; WEISE, p. 204, Wien. ent. Z. x.

*Chalcophana conspicua*, Peru, p. cclxi, *angulicollis*, *densipennis*, Ecuador, p. cclxii, LEFÈVRE, C.R. Ent. Belg. xxxv, n. spp.

*Chalcophyma erythropus*, p. ccliv, *cyclostoma*, Amazons, p. cclv, LEFÈVRE, C.R. Ent. Belg. xxxv, n. spp.

*Chelysida peringueyi*, S. Africa, FAIRMAIRE, p. xc, Bull. Soc. Ent. Fr. 1891, n. sp.

*Chlamys plicata*: larva described ; SCUDDER, Psyche, vi, p. 174.

*Chrysochloa*, Hope, = (*Orina*, Chev.) ; BEDEL, p. 156 L'Ab. xxvii.

*Chrysochus conspectus*, Laos, LEFÈVRE, p. 200, N. Arch. Mus. (3) ii, n. sp.

*Chrysogramma trifasciata*, p. xlii, fig. 12, *C. ? septempunctata*, fig. 13, *omitemia*, fig. 14, p. 304, *C. pictipennis*, fig. 15, p. 305, Mexico, JACOBY, Biol. Centr. Am. Col. vi (1) Supp., n. spp.

*Chrysolampra verrucosa*, Laos, LEFÈVRE, p. 192, N. Arch. Mus. (3) ii, n. sp.

*Chrysomela korbi*, Spain, WEISE, p. 149, Deutsche e. Z. 1891 ; *C. tieu-tuini*, Niger, FAIRMAIRE, p. 272, Ann. Soc. Ent. Fr. 1891 ; *C. hova*, Madagascar, DUVIVIER, p. cclxvi, C.R. Ent. Belg. xxxv ; *C. democratica*, E. India, *id.* p. xliii, *t. c.* : n. spp.

*Clypeolaria laticollis*, Philippines, LEFÈVRE, p. cclxviii, C.R. Ent. Belg. xxxv, n. sp.

*Clytra plagiata*, p. xxix, *crassipes*, p. xxxi, E. India, DUVIVIER, C.R. Ent. Belg. xxxv ; *C. chlorotica*, *orientalis*, E. India, *revoili*, Somaliland, LEFÈVRE, p. ccl, C.R. Ent. Belg. xxxv : n. spp.

*Cneorane foveicollis*, S. Africa, JACOBY, Ent. xxiv, Supp. p. 37, n. sp.

*Colaspidea arachnoides*, Cape Good Hope, DUVIVIER, p. cliii, C.R. Ent. Belg. xxxv, n. sp.

*Colaspidema discoidalis*, E. Africa, FAIRMAIRE, p. cciv, C.R. Ent. Belg. xxxv, n. sp.

*Colaspis montana*, Ecuador, JACOBY, in Whympers Supp. App. p. 82 ; *C. chevrolati*, St. Domingo, *geminata*, Brazil, p. cclvii, *chlorana*, Bogota, *rugulosa*, Brazil, *erratica*, Buenos Ayres, *metallica*, Cayenne, p. cclviii, LEFÈVRE, C.R. Ent. Belg. xxxv ; *C. consentanea*, *alternata*, *geniculata*, p. 290, *densicollis*, *luteipes*, p. 291, *minuta*, p. 292, Brazil, *id.* Ann. Soc. Ent. F. 1891 : n. spp.

*Colaspoides paviei*, *ovalis*, p. 201, *prasina*, p. 202, Laos, LEFÈVRE, N. Arch. Mus. (3) ii ; *C. lurida*, p. 295, *suturalis*, *plagiata*, p. 296, Bahia,

*id.* Ann. Soc. Ent. Fr. 1891; *C. discoidea*, *notata*, *picturata*, p. cclxxviii, *nigrimana*, Brazil, *humilis*, Cumana, p. cclxxix, *id.* C.R. Ent. Belg. xxxv : n. spp.

*Oolaspasoma tibettanum*, Pedong, JACOBY, Ent. xxiv, Supp. p. 35; *C. bicallosum*, Bengal, LEFÈVRE, p. cclxviii, C.R. Ent. Belg. xxxv; *C. albo-villosum*, E. India, DUVIVIER, p. xl, C.R. Ent. Belg. xxxv; *C. affine*, Laos, LEFÈVRE, p. 195, N. Arch. Mus. (3) ii : n. spp.

*Coptocephala ventralis*, Assam, JACOBY, Ent. xxiv, Supp. p. 32, n. sp.

*Coptocycla nigroseta*, *vernica*, E. Africa, FAIRMAIRE, p. ccxvi, C.R. Ent. Belg. xxxv, n. spp.

*Corynodes bicolor*, E. Africa, FAIRMAIRE, p. ccxiii, C.R. Ent. Belg. xxxv; *C. curvipes*, Bengal, DUVIVIER, p. xlii, *t. c.*; *C. paviei*, p. 198, *deletus*, p. 199, Indo-China, LEFÈVRE, N. Arch. Mus. (3) ii; *C. andamansis*, Andaman Is., *speciosus*, S'kkim, p. cclxxvi, *amœnus*, Upper Tenasserim, p. cclxvii, LEFÈVRE, C.R. Ent. Belg. xxxv : n. spp.

*Corysthea cribrata*, Bahia, LEFÈVRE, p. 293, Ann. Soc. Ent. Fr. 1891; *C. chalybaea*, Bogota, LEFÈVRE, p. cclxiii, C.R. Ent. Belg. xxxv : n. spp.

*Coscinoptera*, habits of larva; COCKERELL, Ent. M. M. (2) ii, p. 190.

*Crepidodera amplicollis*, pl. xlii, fig. 9, p. 283, *zapotensis*, *tibialis*, *atra*, p. 284, *C. ? flaveola*, p. 285, Central America, JACOBY, Biol. Centr. Am. Col. vi (1) Supp., n. spp.

*Crioceris campestris*, *asparagi*, *macilentia*, varietal note; BEDEL, p. 155, L'Ab. xxvii.

*Cryptocephalus duplicatus*, Suff., a valid species, its characters; WEISE, p. 148, Deutsche e. Z. 1891. *C. melanoxanthus*, Solsky, characters of; WEISE, p. 181, Wien. ent. Z. x.

*C. crenatostriatus*, *oblongosignatus*, p. 369, *clytroides*, p. 370, *mechowi*, p. 371, *ferrugineus*, p. 372, West Africa, WEISE, Deutsche e. Z. 1891; *C. oberthuri*, Madagascar, DUVIVIER, p. ccxl, C.R. Ent. Belg. xxxv; *C. profundesulcatus*, *iridicolor*, *costipennis*, p. ccclxiv, *perroti*, *betsileo*, *marginicollis*, p. ccclxv, Madagascar, *id. t. c.*; *C. konbirensis*, p. xxxiv, *mephistopheles*, p. xxxvi, E. India, *id. t. c.* : n. spp.

*Cynorta abdominalis*, Java, JACOBY, Ent. xxiv, Supp. p. 36, n. sp.

↓ *Cynortella*, n. g., *Galerucides*, p. ccxix, for *C. scutellaris*, n. sp., Madagascar, p. ccxxx, DUVIVIER, C.R. Ent. Belg. xxxv.

↓ *Cyrsylus*, n. g., near *Systema*, for *C. recticollis*, pl. xlii, fig. 16, p. 306, *crassicornis*, fig. 17, *fulvipes*, p. 307, *basalis*, *vittatus*, fig. 19, p. 308, n. spp., Central America, JACOBY, Biol. Centr. Am. Col. vi (1) Supp.

*Damia tonkinensis*, Tonkin, LEFÈVRE, p. ccliv, C.R. Ent. Belg. xxxv, n. sp.

*Dermorhytis unicolor*, E. India, DUVIVIER, p. xxxvii, C.R. Ent. Belg. xxxv, n. sp.

*Diabrotica*: synonymical note and bibliographical notes on species described by authors other than Baly; GAHAN, Tr. E. Soc. 1891, pp. 521–524. *D. 12-punctata*, life-history; GARMAN, Psyche, vi, pp. 28, 44, & 78, and habits and life-history, RILEY, Ins. Life, iv, pp. 104–108.



*D. semifemorata*, Bolivia, p. 420, *balyana*, Ecuador, p. 421, *azureipennis*, Cayenne, p. 426, *denotata* (= *bipartita*, Baly), Ecuador, p. 427, *cribrata*, *digna*, *marginipennis*, p. 430, *albidocincta*, p. 431, Brazil, *teniolata*, Peru, *melanospila*, p. 434, *significata*, p. 435, *maculatipennis*, *nigropunctata*, p. 436, *biseriata*, p. 437, Brazil, *humeralis*, Peru, *bistrigata*, p. 438, *decemverrucata*, p. 439, Brazil, *reichei*, Ecuador, p. 441, *belemea*, Pará, *spectabilis*, p. 443, *conformis*, p. 444, *delecta*, p. 445, Amazons, *zelota*, Brazil, pp. 373 & 447, *dulcis*, Cayenne, p. 447, *fasciatipennis*, Venezuela, p. 448, *diversa*, Amazons, p. 451, *subsimilis*, Colombia, p. 456, *tarsata*, Bahia, p. 460, *assimilis*, Ecuador, p. 464, *marginicollis*, Colombia, p. 465, *sanguineipennis*, Peru, p. 466, *quadripunctata*, Colombia, p. 468, GAHAN & BALY, Tr. E. Soc. 1891, n. spp.

*Diacantha*, notes on the characters of; JACOBY, Ent. xxiv, p. 236.

*Diapromorpha ingens*, W. Africa, LEFÈVRE, p. clxxiii, Bull. Soc. Ent. Fr. 1891; *D. (Ætheomorpha) variegata*, Indo-China, LEFÈVRE, p. 191, N. Arch. Mus. (3) ii : n. spp.

*Dibolia areia*, metamorphoses; ROLFS, Ent. News, ii, p. 13.

*D. viridis*, Ecuador, JACOBY, in Whympers Supp. App. p. 86; *D. constricta*, *violacea*, Mexico, JACOBY, p. 290, Biol. Centr. Am. Col. vi (1) Supp. : n. spp.

*Diphaulaca glabrata*, Ecuador, JACOBY, in Whympers Supp. App. p. 86, n. sp.

*Disonychia maculipes*, p. 274, *affinis*, *angulata*, pl. xlii, fig. 2, *horni*, p. 275, *limbata*, p. 276, Central America, JACOBY, Biol. Centr. Am. Col. vi (1) Supp., n. spp.

*Donucia*: revision of the N. American species; LENG, Tr. Am. Ent. Soc. xviii, pp. 159, &c.

*D. floride*, p. 166, LENG, Tr. Am. Ent. Soc. xviii, n. sp.

*Doryphora stabilis*, Panama, JACOBY, p. 144, pl. xli, fig. 17, Biol. Centr. Am. Col. vi (1) Supp.; *D. picturata*, Ecuador, JACOBY, in Whympers Supp. App. p. 84 : n. spp.

*Edusa*: synonymy and composition of the genus discussed, and its species tabulated; BLACKBURN, pp. 140-143, Tr. R. Soc. S. Austr. xiv.

*E. varians*, *diversicollis*, p. 144, *froggatti*, *spinicollis*, p. 145, *distincta*, *minor*, *ænea*, p. 146, *perplexa*, *lineata*, p. 147, *læta* (altered to *lata*, p. 345), *bella*, p. 148, *glauca*, *pilifera*, p. 149, *fraterna*, *hirta*, p. 150, *pavens*, *meyricki*, *inermis*, p. 151, *glabra*, *singularis*, p. 152, Australia, BLACKBURN, Tr. R. Soc. S. Austr. xiv, n. spp.

*Edusia* (sic) *germari* (no locality), LEFÈVRE, p. cclxix, C.R. Ent. Belg. xxxv, n. sp.

*Elytrosphæra marginicollis*, pl. xli, fig. 18, p. 256, *bifasciata*, fig. 19, *erratica*, fig. 20, p. 257, Mexico, JACOBY, Biol. Centr. Am. Col. vi (1) Supp., n. spp.

*Endocephalus germari*, Brazil, LEFÈVRE, p. cclxxvii, C.R. Ent. Belg. xxxv; *E. fulvicollis*, Bahia, *id.* p. 295, Ann. Soc. Ent. Fr. 1891 : n. spp.

*Epitrix metallica*, p. 287, *obliterata*, *robusta*, p. 288, *æneicollis*, *ferruginea*, *piceo-marginata*, p. 289, Mexico, JACOBY, Biol. Centr. Am. Col. vi (1) Supp., n. spp.

*Eriphytina*, n. n. for *Eriphyle*, Baly (*nec* Stål), with *E. vicina*, Peru, *cyanicornis*, Amazons, n. spp. ; LEFÈVRE, p. cclxiii, C.R. Ent. Belg. xxxv.

*Eulychius dorsalis*, Madagascar, DUVIVIER, p. cexl, C.R. Ent. Belg. xxxv, n. sp.

*Euplectroscelis* and *Homophyla* : note on the species appertaining to them ; JACOBY, p. 308, Biol. Centr. Am. Col. vi (1) Supp.

*Eurydemus raffrayi*, Zanzibar, LEFÈVRE, C.R. Ent. Belg. xxxv, p. cclxxii, n. sp.

↓ *Exoceras*, n. g., near *Syphrea*, for *E. facialis*, n. sp., Panama, pl. xlii, figs. 1 & 1a ; JACOBY, p. 273, Biol. Centr. Am. Col. vi (1), Supp.

*Galeruca batika*, Chiclana, WEISE, p. 150, Deutsche e. Z. 1891, n. sp.

*Galerucella semipullata*, metamorphoses ; OLLIFF, pp. 218 & 219, Agric. Gaz. N.S.W., cuts.

*G. humbloti*, Madagascar, DUVIVIER, p. cexliv, C.R. Ent. Belg. xxxv, n. sp.

*Glyptoscelis gayi*, Chili, LEFÈVRE, p. cclxx, C.R. Ent. Belg. xxxv, n. sp.

*Gonophora interrupta*, Congo, DUVIVIER, p. ccccxii, C.R. Ent. Belg. xxxv, n. sp.

*Gynandrophthalma apicalis*, S. Africa, *seminigra*, Sierra Leone, JACOBY, Ent. xxiv, Supp. 35 ; *E. semipunctata*, E. India, DUVIVIER, p. xxxiii, C.R. Ent. Belg. xxxv ; *G. centrostigma*, p. ccli, Brazil, *nigropicta*, p. cclii, Tranquebar, LEFÈVRE, C.R. Ent. Belg. xxxv : n. spp.

*Habrophora viridicollis*, Panama, JACOBY, p. 233, Biol. Centr. Am. Col. vi (1) Supp., n. sp.

*Haltica* : characters of the British species ; EDWARDS, Ent. M. M. (2) ii, pp. 289-294. *H. brevicollis*, Foudr., note on ; BEDEL, p. 156, L'Ab. xxvii.

*H. iberica*, Cuença, WEISE, p. 373, Deutsche e. Z. 1891 ; *H. (Graptoderu) hova*, Madagascar, DUVIVIER, p. ccccxiii, C.R. Ent. Belg. xxxv ; *H. abdominalis*, *satellitica*, p. 267, *simplex*, *amicaula*, *elongata*, p. 268, *angulicollis*, *fulvipes*, p. 269, *gracilis*, *purulensis*, *longicornis*, pl. xli, fig. 25, p. 270, *cupricollis*, *rugosa*, p. 271, *sublaevipennis*, p. 272, Central America, JACOBY, Biol. Centr. Am. Col. vi (1) Supp. : n. spp.

*Haplosomyx fraterna*, Java, DUVIVIER, p. cli, C.R. Ent. Belg. xxxv ; *H. philippinensis*, Philippines, JACOBY, Ent. xxiv, Supp. p. 64 : n. spp.

*Hemiphrynus tenuicornis*, pl. xli, fig. 23, p. 265, *sulcatipennis*, fig. 24, p. 266, Mexico, JACOBY, Biol. Centr. Am. Col. vi (1) Supp., n. spp.

*Hermæophaga fulva*, p. 261, *cyaneipennis*, *smithi*, *æneipennis*, p. 262, *semistriata*, *teapensis*, *fulvitaris*, p. 263, Central America, JACOBY, Biol. Centr. Am. Col. vi (1) Supp., n. spp.

*Heteraspis æneipennis*, Laos, LEFÈVRE, p. 194, N. Arch. Mus. (3) ii, n. sp.

*Hispa dilaticornis*, E. India, DUVIVIER, p. xlviii, C.R. Ent. Belg. xxxv ; *H. sikoræ*, p. cclxvi, *æneipennis*, *hystrix*, *tristis*, p. cclxvii, Madagascar, *id. t. c.* : n. spp.

*Homophyla nigrita*, *fulvifrons*, *chiriquensis*, p. 309, *pallida*, pl. xlii, fig. 21, p. 310, Central America, JACOBY, Biol. Centr. Am. Col. vi (1) Supp., n. spp.

*Hoplasoma unicolor*, Ill., = (*corniculata*, All.); DUVIVIER, p. xlv, C.R. Ent. Belg. xxxv.

*Haplosoma* (sic) *metallica*, New Guinea, JACOBY, Ent. xxiv, Supp. p. 36, n. sp.

*Hoplionota nigra*, Madagascar, DUVIVIER, p. ccclxviii, C.R. Ent. Belg. xxxv, n. sp.

*Hyperacantha*, merged in *Idacantha*; JACOBY, Ent. xxiv, Supp. 41.

*H. abdominalis*, *elegantula*, Madagascar, DUVIVIER, p. cccxvii, C.R. Ent. Belg. xxxv, n. sp.

*Idacantha*: notes on its characters. and on Allard's descriptions; JACOBY, Ent. xxiv, Supp. pp. 39-41. *I.* and *Hyperacantha*, characters and synonymy discussed; ALLARD, p. cxxvi, Bull. Soc. Ent. Fr. 1891.

*I. madagascariensis*, Madagascar, *abdominalis*, p. 40, *punctatissima*, p. 41, S. Africa, JACOBY, Ent. xxiv, Supp., n. spp.

*Iphitroides*, n. g., near *Prasona*, for *I. quadrimaculata*, pl. xlii, fig. 6, p. 279, *quadripunctata*, fig. 7, *nigrocincta*, fig. 8, *violaceipennis*, p. 280, n. spp., Mexico, JACOBY, Biol. Centr. Am. Col. vi (1) Supp.

*Ischyronota*, n. g., for part of *Cassida*; WEISE, p. 204, Wien. ent. Z. x.

*Labidostomis elegans*, Lef., = (*reitteri*, Weise); BEDEL, p. 156, L'Ab. xxvii.

*L. funerea*, Kashmir, FAIRMAIRE, p. ciii, C.R. Ent. Belg. xxxv, n. sp.

*Lachnæa indica*, Bengal, DUVIVIER, p. xxviii, C.R. Ent. Belg. xxxv, n. sp.

*Laccoptera aurosa*, E. Africa, FAIRMAIRE, p. ccvii, C.R. Ent. Belg. xxxv, n. sp.

*Lactica oberthuri*, Madagascar, DUVIVIER, p. ccccxiii, C.R. Ent. Belg. xxxv; *L. inornata*, Panama, p. 258, *crassicornis*, Mexico, *quadrinotata*, pl. xli, fig. 21, Guatemala, p. 259, JACOBY, Biol. Centr. Am. Col. vi (1) Supp.: n. spp.

*Lema seriefoveata*, E. Africa, FAIRMAIRE, p. cciii, C.R. Ent. Belg. xxxv; *L. vexilla*, Madagascar, *id.* p. ccccxiii, *t. c.*; *L. virididorsata*, Madagascar, *id.* p. cccxiv, *t. c.*; *L. bengalensis*, *crassipalpis*, E. India, DUVIVIER, p. xxvi, *t. c.*; *L. assamensis*, *nigricollis*, Assam, JACOBY, Ent. xxiv, Supp. p. 31: n. spp.

*Leptinotursa angustovittata*, pl. xli, fig. 15, *typographica*, fig. 16, p. 254, Mexico, JACOBY, Biol. Centr. Am. Col. vi (1) Supp., n. spp.

*Leptosonyx nocturnus*, Transcaspian region, SEMENOW, p. 381, Hor. Ent. Ross. xxv, n. sp.

*Liniscus natalensis*, S. Africa, *strigaticeps*, W. Africa, LEFÈVRE, p. cclxx, C.R. Ent. Belg. xxxv, n. spp.

*Lithonoma limbata*, n. var. ♀, *abbreviata* (= *andalusiaca*, All., nec Rosh.); WEISE, p. 150, Deutsche e. Z. 1891.

*Longitarsus ovipennis*, p. 298, *haroldi*, *amulensis*, *teapensis*, p. 299, *antennatus*, *occidentalis*, p. 300, Mexico, JACOBY, Biol. Centr. Am. Col. vi (1) Supp., n. spp.

*Luperosoma*, n. g. (*Platyxanthinæ*), for *L. marginata*, n. sp., Ecuador, JACOBY, p. 87, in Whympers Supp. App.

*Luperus* : translation into French of Weise's tables ; GUILLÉBEAU, pp. 290, &c., Rev. d'Ent. x.

*L. africanus*, S. Africa, JACOBY, Ent. xxiv, Supp. p. 37, n. sp.

*Luprea marginipennis*, Panama, JACOBY, p. 292, Biol. Centr. Am. Col. vi (1) Supp., n. sp.

*Malacosoma madagascariensis*, Madagascar, DUVIVIER, p. cccxvii, C.R. Ent. Belg. xxxv, n. sp.

*Mulaxia assamensis*, E. India, JACOBY, Ent. xxiv, Supp. p. 34, n. sp.

*Malegria schimperi*, Abyssinia, LEFÈVRE, p. cclxviii, C.R. Ent. Belg. xxxv, n. sp.

*Melitonoma patruelis*, p. cclii, *multisignata*, Somaliland, *pedestris*, Abyssinia, p. ccliii, LEFÈVRE, C.R. Ent. Belg. xxxv, n. spp.

† *Menioporos*, n. g., near *Oleoporus*, for *Menius thoracicus*, Duviv. (*infra*) ; DUVIVIER, p. cccxiv, C.R. Ent. Belg. xxxv.

*Menius chalceatus*, Cameroons, *rufipes*, Delagoa Bay, *plagiatus*, Old Calabar, LEFÈVRE, p. cclxxi, C.R. Ent. Belg. xxxv ; *M. thoracicus*, *fulvipennis*, Madagascar, DUVIVIER, p. ccxli, t. c. : n. spp.

*Metachroma longicollis*, *ornata*, p. 234, *bipunctata*, *quadrimaculata*, p. 235, Central America, JACOBY, Biol. Centr. Am. Col. vi (1) Supp., n. spp.

*Metaxyonycha plagiata*, Brazil, LEFÈVRE, p. cclvi, C.R. Ent. Belg. xxxv ; *M. gounellei*, Bahia, *id.* p. 289, Ann. Soc. Ent. Fr. 1891 : n. spp.

*Metellus*, Jac., = (*Nacræa*, Baly) ; JACOBY, Ent. xxiv, Supp. p. 65.

*M. uniformis*, Java, JACOBY, Ent. xxiv, Supp. p. 65, n. sp.

† *Metopædema*, n. g. *Galerucides*, p. cccxviii, for *M. paradoxum*, n. sp., Madagascar, p. cccix ; DUVIVIER, C.R. Ent. Belg. xxxv.

† *Mionycha*, n. subg. of *Cassida*, WEISE, p. 204, Wien. ent. Z. x.

*Miopristis hottentota*, S. Africa, LEFÈVRE, p. cclxviii, C.R. Ent. Belg. xxxv, n. sp.

*Mniophila muscorum* and *wroblewskii*, distinctive characters ; GERHARDT, Z. Ent. Bresl. (n.s.) xvi, p. 32.

† *Monocestoides*, n. g. (*Cælomerites*), for *M. perrotti*, n. sp., Madagascar ; DUVIVIER, p. ccxliii, C.R. Ent. Belg. xxxv.

*Monolepta hæmatura*, E. Africa, FAIRMAIRE, p. cccv, C.R. Ent. Belg. xxxv ; *M. konbirensis*, E. India, DUVIVIER, p. xlvii, C.R. Ent. Belg. xxxv : n. spp.

*Myochrous carinatus*, Mexico, JACOBY, p. 236, Biol. Centr. Am. Col. vi (1) Supp., n. sp.

*Myrcina balyi* referred to *Sebaethe* ; *M. spectabilis*, n. var. *quadrimaculata* ; DUVIVIER, p. cclxvi, C.R. Ent. Belg. xxxv.

*M. limbata*, Madagascar, DUVIVIER, p. ccxlii, C.R. Ent. Belg. xxxv, n. sp.

† *Neodera*, n. g., near *Crepidodera*, for *N. fraterna*, p. cccxiv, *imitatrix*, *emarginata*, p. cccxv, n. spp., Madagascar ; DUVIVIER, C.R. Ent. Belg. xxxv.

† *Neomenius*, n. g., near *Menius*, p. ccxli, for *N. rufipennis*, n. sp., Madagascar ; DUVIVIER, p. ccxlii, C.R. Ent. Belg. xxxv.

*Nephrica inornata*, Panama, JACOBY, pl. xliii, fig. 4, p. 277, Biol. Centr. Am. Col. vi (1) Supp., n. sp.

*Nodonota seminigra*, Peru, LEFÈVRE, p. cclv, C.R. Ent. Belg. xxxv, n. sp.

*Nodostoma bengalense*, E. India, DUVIVIER, p. xxxviii, C.R. Ent. Belg. xxxv; *N. semperi*, Philippines, *apicicorne*, Sumatra, p. cclxiv, *geniculatum*, E. Indies, *quadrinotatum*, Java, p. cclxv, *nigromaculatum*, Sumatra, *cyaneum*, Sikkim, p. cclxvi, LEFÈVRE, C.R. Ent. Belg. xxxv : n. spp.

<sup>1</sup>*Odiontionycha*, n. subg. of *Cassida*; WEISE, p. 204, Wien. ent. Z. x.

*Edionychis goudoti*, n. var. *apicata*; DUVIVIER, p. cclxv, C.R. Ent. Belg. xxxv.

*E. grossepunctata*, p. cccxv, *hova*, p. cccxvi, Madagascar, DUVIVIER, C.R. Ent. Belg. xxxv, n. spp.

*Oides semipunctata*, var. noticed, p. 456; *O. pectoralis*, Clk., = (*nigripes*, Jac.), p. 457; *maculata*, Ol., = (*subhemispherica*, Guér., and *indica*, Baly), p. 460; GAHAN, Ann. N. H. (6) vii.

*O. stormsi*, Lake Tanganyika, DUVIVIER, p. ccccxi, C.R. Ent. Belg. xxxv; *O. nigripes*, Sikkim, JACOBY, Ent. xxiv, Supp. p. 34; *O. bivittata*, Celebes, *quadrivittata*, Malay Arch., p. 453, *tarsalis*, Mombas?, p. 454, *assimilis*, Old Calabar, p. 455, *humeralis*, Cameroons, p. 456, *maculosa*, *innocua*, p. 457, *coccinelloides*, p. 458, India, *ovatipennis*, N. S. Wales, p. 459, GAHAN, Ann. N. H. (6) vii : n. spp.

<sup>4</sup>*Oidosoma*, n. g., near *Gonioctena*, p. 172, for *O. rufescens*, *limbipenne*, Trop. Africa, n. spp., p. 173, QUEDENFELDT, B. E. Z. xxxvi.

*Orina alpestris*, variation described, p. 374, *commutata*, Suff., redescribed, p. 375; WEISE, Deutsche e. Z. 1891.

*Orodes*, n. g., near *Disonycha*, p. 276, for *O. nigropictus*, n. sp., Panama, pl. xlii, fig. 3, p. 277; JACOBY, Biol. Centr. Am. Col. vi (1) Supp.

*Orthygia*, n. g., near *Crepidodera*, for *O. nigritarsis*, p. 285, *unifasciata*, pl. xlii, fig. 10, p. 286, n. spp., Mexico; JACOBY, Biol. Centr. Am. Col. vi (1) Supp.

*Otilea ferruginea*, Cayenne, *amazonica*, Amazons, LEFÈVRE, p. cclxi, C.R. Ent. Belg. xxxv, n. spp.

*Pachybrachys fulvipes*, *azureus*, Suff., notes on; WEISE, p. 147, Deutsche e. Z. 1891.

*P. korbi*, Spain, *siculus*, Sicily, WEISE, p. 145, Deutsche e. Z. 1891, n. spp.

*Pagria bipunctata*, p. cclxvi, Hindostan, *liturata*, W. Africa, p. cclxvii, LEFÈVRE, C.R. Ent. Belg. xxxv, n. spp.

*Palæothona elongata*, *imitans*, *flavicollis*, p. 301, *smithi*, *nigricollis*, *viridis*, p. 302, *godmani*, *dilaticornis*, p. 303, Central America, JACOBY, Biol. Centr. Am. Col. vi (1) Supp., n. spp.

*Paria picta*, p. 238, British Honduras, *binotata*, Mexico, p. 239, JACOBY, Biol. Centr. Am. Col. vi (1) Supp., n. spp.

<sup>4</sup>*Patrisma*, n. g., near *Lacoptera*, p. 272, for *P. pyramidalis*, n. sp., Central Africa, p. 273, pl. v, fig. 2; FAIRMAIRE, Ann. Soc. Ent. Fr. 1891.

*Peploptera schimperi*, Abyssinia, LEFÈVRE, C.R. Ent. Belg. xxxv, n. sp.

*Phædon fuscum*, *varicolor*, *seticornis*, p. 241, *multipunctatus*, p. 242, Mexico, JACOBY, Biol. Centr. Am. Col. vi (1) Supp., n. spp.

*Phanæta* (?) *strigicollis*, p. 239, *chrysodinoïdes*, p. 240, Mexico, JACOBY, Biol. Centr. Am. Col. vi (1) Supp., n. spp.

*Pheloticus sansibaricus*, Zanzibar, LEFÈVRE, p. cclxxi, C.R. Ent. Belg. xxxv ; *P. haroldi*, Madagascar, DUVIVIER, p. cclx, t. c. : n. spp.

*Phratora vitellina*, note on its injuries; ORMEROD, Rep. 1890, pp. 138-142.

*Phydania nigriventris*, Mexico, JACOBY, p. 311, pl. xlii, fig. 23, Biol. Centr. Am. Col. vi (1) Supp., n. sp.

*Phyllobrotica trimaculata*, Ball., validity queried ; KRAATZ, Soc. Ent. v, p. 162.

*Phyllobrotica humeralis*, n. sp., cf. *Scarabæida*, *Phyllopertha*.

*Phyllotreta gallica*, France, BRISOUT, p. clxxxv, Bull. Soc. Ent. Fr. 1891 ; *P. pallidipennis*, p. 34, *dilutipennis*, *iris*, p. 35, Sea of Aral, REITTER, Deutsche e. Z. 1891 ; *P. lativitta*, p. 297, *subrugosa*, p. 298, Mexico, JACOBY, Biol. Centr. Am. Col. vi (1) Supp. : n. spp.

*Physonychis varicornis*, Madagascar, DUVIVIER, p. ccccxiv, C.R. Ent. Belg. xxxv, n. sp.

*Phytodecta nivosa*, n. var. *ruficollis*, *variabilis*, variation described ; WEISE, p. 160, Deutsche e. Z. 1891.

*Plagioderma fulvomargo*, E. Africa, QUEDENFELDT, p. 173, B. E. Z. xxxvi ; *P. tarsata*, Madagascar, DUVIVIER, p. cclxvi, C.R. Ent. Belg. xxxv ; *P. viridimaculata*, Panama, pl. xli, fig. 2, p. 242, *obscuripennis*, Mexico, p. 243, JACOBY, Biol. Centr. Am. Col. vi (1) Supp. : n. spp.

*Platypria nigrospinoso*, E. Africa, FAIRMAIRE, p. cccv, C.R. Ent. Belg. xxxv, n. sp.

*Platyxantha variabilis*, Java, JACOBY, Ent. xxiv, Supp. p. 64, n. sp.

*Plectrotetra multipunctata*, *nigripennis*, pl. xli, fig. 22, Mexico, JACOBY, p. 264, Biol. Centr. Am. Col. vi (1) Supp., n. spp.

*Pecilomorpha adusta*, E. Africa, QUEDENFELDT, p. 171, B. E. Z. xxxvi, n. sp.

*Prasonotus chapuisi*, n. n. for *morbillosus*, Chap., nec Baly ; BLACKBURN, p. 139, Tr. R. Soc. S. Austr. xiv.

† *Pseudadimonia*, n. g. *Cælomerites*, p. xlvi, for *Colaspis variolosa*, Hope ; DUVIVIER, p. xlvi, C.R. Ent. Belg. xxxv.

*Pseudocophora javanensis*, Java, DUVIVIER, p. cxlix, C.R. Ent. Belg. xxxv, n. sp.

*Pseudodera balyi*, China, JACOBY, Ent. xxiv, Supp. p. 62, n. sp.

† *Pseudodibolia*, n. g., near *Dibolia*, for *P. picea*, n. sp., Mexico, pl. xlii, fig. 20 ; JACOBY, p. 291, Biol. Centr. Am. Col. vi (1) Supp.

*Psylliodes mexicana*, p. 311, *melanocephala*, *capitata*, p. 312, Central America, JACOBY, Biol. Centr. Am. Col. vi (1) Supp., n. spp.

*Ptocadica bifusciata*, Costa Rica, JACOBY, p. 292, Biol. Centr. Am. Col. vi (1) Supp., n. sp.

*Rhabdopterus lateralis*, Amazons, *scabrosus*, Brazil, p. cclix, *erosulus*, *aureolus*, Colombia, *punctatosulcatus*, Amazons, p. cclx, LEFÈVRE, C.R. Ent. Belg. xxxv, n. spp.

*Rhagiosoma fraternum*, Madagascar, DUVIVIER, p. cccxxviii, C.R. Ent. Belg. xxxv, n. sp.

*Rhembastus nigratarsis, striatipennis*, W. Africa, LEFÈVRE, p. cclxxv, C.R. Ent. Belg. xxxv, n. spp.

*Sagra oberthüri*, Madagascar, DUVIVIER, p. cccxxviii, C.R. Ent. Belg. xxxv; *S. nitidiventris, tibialis*, E. Africa, FAIRMAIRE, C.R. Ent. Belg. xxxv, p. cccii : n. spp.

√ *Sanckia*, n. g. *Aphtonites*, for *S. johanna*, p. cccxvi, *venusta*, p. cccxvii, n. spp., Madagascar, DUVIVIER, C.R. Ent. Belg. xxxv.

*Sastra hirtipennis*, Assam, JACOBY, Ent. xxiv, Supp. p. 33, n. sp.

*Scelodonta indica*, Konbir, DUVIVIER, p. xxxix, C.R. Ent. Belg. xxxv; *S. maculosa*, Zambesi, *areolata*, Hindostan, LEFÈVRE, p. cclxvii, C.R. Ent. Belg. xxxv : n. spp.

*Sclerophædon*, characters of the species of; WEISE, p. 159, Deutsche e. Z. 1891.

*Sermylroides vittipennis*, Java, DUVIVIER, p. cl, C.R. Ent. Belg. xxxv, n. sp.

√ *Sikkimia*, n. g. (*Mimastrites*), p. cliv, for *S. antennata*, n. sp., Sikkim, p. clv; DUVIVIER, C.R. Ent. Belg. l.

*Simæthea nigroplagiata*, Java, JACOBY, Ent. xxiv, Supp. p. 62, n. sp.

*Sphæroderma cerulea*, Panama, JACOBY, p. 310, pl. xlii, fig. 22, Biol. Centr. Am. Col. vi (1) Supp., n. sp.

*Spintherophyta aciculata, bahiensis*, Brazil, LEFÈVRE, p. 287, Ann. Soc. Ent. Fr. 1891; *S. peruana*, Peru, *fulgens*, Brazil, LEFÈVRE, p. ccliv, C.R. Ent. Belg. xxxv : n. spp.

*Stilodes quadristriata*, Panama, JACOBY, p. 252, pl. xli, fig. 13, Biol. Centr. Am. Col. vi (1) Supp., n. sp.

*Stylosomus fausti*, Turkestan, REITTER, p. 34, Deutsche e. Z. 1891, n. sp.

√ *Suctes*, n. g., near *Mesodera*, for *S. niger*, n. sp., Mexico, pl. xlii, fig. 11; JACOBY, p. 286, Biol. Centr. Am. Col. vi (1) Supp.

*Syagrus æratus*, referred to *Menius*; LEFÈVRE, p. cclxxii, C.R. Ent. Belg. xxxv.

*S. caliginosus*, Zanzibar, p. cclxxii, *geniculatus, apicicornis, femoratus*, p. cclxxiii, *limbatus*, W. Africa, *corrosicollis, sexnotatus, variolosus*, Zanzibar, p. cclxxiv, *varicolor*, Old Calabar, p. cclxxv, LEFÈVRE, C.R. Ent. Belg. xxxv, n. spp.

*Systema teniata* = (*discicollis, semivittata, capitata*, Jac.) ; JACOBY, Biol. Centr. Am. Col. vi (1) Supp.

*S. viridilimbata*, p. 281, *robusta*, p. 282, *sulphurea*, p. 283, *S. ? minuta*, p. 282, Central America, JACOBY, Biol. Centr. Am. Col. vi (1) Supp., n. spp.

*Teaspes costata, velutina, striatopilosa*, Brazil, LEFÈVRE, p. 288, Ann. Soc. Ent. Fr. 1891, n. spp.

*Titubæa sansibarica*, Bagamoyo, *cognata*, Abyssinia, LEFÈVRE, p. ccclix, C.R. Ent. Belg. xxxv; *T. paviei*, Indo-China, LEFÈVRE, p. 189, N. Arch. Mus. (3) ii : n. spp.

*Trichaltica costatipennis*, Ecuador, JACOBY, in Whympers Supp. App. p. 85, n. sp.

*Tricliona puncticeps*, E. India, DUVIVIER, p. xli, C.R. Ent. Belg. xxxv;  
*T. melanura*, Cambodia, LEFÈVRE, p. 197, N. Arch. Mus. (3) ii : n. spp.

*Tymnes brasiliensis*, p. 293, *gounellei*, p. 294, Brazil, LEFÈVRE, Ann. Soc. Ent. Fr. 1891, n. spp.

*Typophorus signatus*, Bahia, LEFÈVRE, p. 294, Ann. Soc. Ent. Fr. 1891;  
*T. interstitialis*, Mexico, p. 236, *apicicornis*, Panama, p. 237, *limbata*, Guatemala, p. 238, JACOBY, Biol. Centr. Am. Col. vi (1) Supp. : n. spp.

*Zygogramma fasciatipennis*, pl. xli, fig. 6, p. 249, *obscurofasciata*, fig. 7, *durangoensis*, fig. 8, *maculicollis*, fig. 9, p. 250, *militaris*, fig. 10, *decem-pustulata*, fig. 11, p. 251, *thoracica*, fig. 12, p. 252, Mexico, JACOBY, Biol. Centr. Am. Col. vi (1) Supp., n. spp.

#### LANGURIIDÆ and EROTYLIDÆ.

[Cf. DUVIVIER (221), FAIRMAIRE (254), FAUVEL (275), GORHAM (963), RITSEMA (733, 734, 735).]

*Dacne grandipennis*, p. 232, *curvipes*, Zanzibar, *longiusculus*, Kassai, p. 233, *natalensis*, Natal, *opacicollis*, Zanzibar, *substriata*, Mrogoro, p. 234, FAIRMAIRE, Ann. Soc. Ent. Fr. 1891, n. spp.

*Episcaphula congoana*, p. ccccxii, *tricolor*, p. ccccxiii, Congo, DUVIVIER, C.R. Ent. Belg. xxxv, n. spp.

*Fatua sulcicollis*, Niger, FAIRMAIRE, p. 273, Ann. Soc. Ent. Fr. 1891, n. sp.

*Helota* : catalogue and tables of characters of the described species ; RITSEMA, Notes Leyd. Mus. xiii, pp. 223-232.

*H. vandepolli*, p. 197, *brevis*, p. 199, Borneo, RITSEMA, Notes Leyd. Mus. xiii; *H. ventralis*, p. 251, *affinis*, p. 253, Burma, *id. t. c.* : n. spp.

*Homoiotelus acuminatus*, Ecuador, GORHAM, in Whymper Supp. App. p. 56, n. sp.

† *Neothallis*, n. g., near *Thallis*, p. 151, for *T. nigroænea*, Cr., and *T. bedeli*, n. sp., New Caledonia, p. 152 ; FAUVEL, Rev. d'Ent. x.

† *Platydacne*, n. g., near *Dacne*, p. 234, for *P. vittulata*, n. sp., Congo, p. 235 ; FAIRMAIRE, Ann. Soc. Ent. Fr. 1891.

*Pleosoma* and *Euzestus*, Woll., treated as one genus, forming the family *Pleosomides* ; FAUVEL, p. 162, Rev. d'Ent. x.

*Thallis signata*, New Caledonia, FAUVEL, p. 151, Rev. d'Ent. x, n. sp.

*Triplax rubrica*, Taschkent, REITTER, p. 21, Deutsche e. Z. 1891, n. sp.

#### ENDOMYCHIDÆ.

[Cf. DUVIVIER (221), FAIRMAIRE (261), GORHAM (337, 338).]

† *Dialexia*, n. g., near *Alexia*, p. 146, for *D. setulosa*, n. sp., Guatemala, pl. viii, fig. 16, p. 147 ; GORHAM, Biol. Centr. Am. Col. vii.

*Engonius gratus*, Cochinchina, GORHAM, Ann. Soc. Ent. Fr. 1891, p. 399, n. spp.

† *Erysuma*, n. g., near *Mycetæa*, for *E. parvula*, *lævigata*, p. 145, *orbicularis*, pl. viii, fig. 14, and *E. ? tenuicornis*, fig. 15, p. 146, n. spp., Central America, GORHAM, Biol. Centr. Am. Col. vii.



\**Microsephus*, n. g., position doubtful, for *M. mniophilinus*, n. sp., Central America, pl. viii, fig. 17; GORHAM, p. 149, Biol. Centr. Am. Col. vii.

*Mycetina compacta*, China, FAIRMAIRE, p. ccxix, C.R. Ent. Belg. xxxv, n. sp.

*Trycherus josephus*, Congo, DUVIVIER, p. ccdxxxii, C.R. Ent. Belg. xxxv, n. sp.

## COCCINELLIDÆ.

[Cf. BLACKBURN (74), GORHAM (337, 338, 963), OLLIFF (633), REITTER (700), WEISE (951, 956).]

Classification of the family discussed; GORHAM, p. 150, Biol. Centr. Am. Col. vii.

Habits of *Coccinellidæ* in Australia; OLLIFF, Agric. Gaz. N.S.W. i, pp. 63-66, pl. ix.

\**Botynella*, n. g., *Rhizobiides*, p. 286, for *B. quinque-punctata*, *quadri-punctata*, n. spp., Cuba, p. 287; WEISE, Deutsche e. Z. 1891.

*Brumus trivittatus*, E. Africa, WEISE, p. 80, Deutsche e. Z. 1891, n. sp.

*Cælophora subustulata*, Cochin China, GORHAM, p. 402, Ann. Soc. Ent. Fr. 1892, n. sp.

*Caria thoracica*, Key Is., WEISE, p. 283, Deutsche e. Z. 1891, n. sp.

*Chilocorus semiæneus*, Tzibodes, WEISE, p. 284, Deutsche e. Z. 1891, n. sp.

*Coccinella sanguinea*, larva described; SCUDDER, Psyche vi, p. 173. *C. convergens* a vegetable feeder; WEED, Am. Nat. xxv, p. 764. *C. undecimpunctata* = (*novæzealandica*, Colenso); SHARP, Ins. Life, iii, p. 352. *C. luteipennis*, pl. ix, fig. 1, *emarginata*, pl. viii, fig. 25, *ampla*, pl. ix, fig. 2, *transversoguttata*, pl. viii, fig. 26; Biol. Centr. Am. Col. vii.

*C. reitteri*, Taschkent, WEISE, p. 282, Deutsche e. Z. 1891; *C. cyathigera*, pl. ix, fig. 3, *albopicta*, fig. 4, p. 158, *maculosa*, fig. 5, *compta*, fig. 6, p. 159, *concinna*, p. 160, Centr. America, GORHAM, Biol. Centr. Am. Col. vii : n. spp.

*Epilachna vigintioctopunctata*, habits and metamorphoses; OLLIFF, Agric. Gaz. N.S.W. i, pp. 281-283, cuts.

*Halysia rosti*, Caucasus, WEISE, p. 282, Deutsche e. Z. 1891, n. sp.

*Hippodamia convergens*, varr. figured, pl. viii, figs. 22-24; Biol. Centr. Am. Col. vii.

*Lithophilus osculatii*, note on the name; REITTER, p. 228, Wien. ent. Z. x.

*L. nigripennis*, New Margelan, REITTER, p. 222, Wien. ent. Z. x : *L. krasnowi*, E. Turkestan, SEMENOW, p. 381, Hor. Ent. Ross. xxv : n. spp.

*Megilla maculata*, figured, pl. viii, figs. 19 & 20, Biol. Centr. Am. Col. vii : larva described, SCUDDER, Psyche, vi, p. 173 : number of individuals in a colony of; HOPPING, Ent. News, ii, p. 121.

*Næmia vittigera*, fig. 21, *seriata*, fig. 18, figured, pl. viii, Biol. Centr. Am. Col. vii.

*Enopia pracue*, Himalaya, WEISE, p. 286, Deutsche e. Z. 1891, n. sp.

*Orcus australasiae*, metamorphoses ; OLLIFF, p. 65, pl. ix, Agric. Gaz. N.S.W.

*O. celestis*, S. Australia, BLACKBURN, pp. 153 & 345, Tr. R. Soc. S. Austr. xiv, n. sp.

*Platynaspis litura*, E. Africa, WEISE, p. 285, Deutsche e. Z. 1891, n. sp.  
√ *Smilia*, n. g. (near *Scymnus* ?), for *S. felschei*, n. sp., Florida ; WEISE, p. 288, Deutsche e. Z. 1891.

*Vedalia cardinalis*, the different stages figured ; RILEY, Ins. Life, iii, p. 439.

#### CORYLOPHIDÆ.

[*Cf.* REITTER (694), SCHAUFUSS (768).]

*Clypeaster monstrosus*, Madagascar, SCHAUFUSS, p. 2, Tijdschr. Ent. xxxiv, n. sp.

*Moronillus sibiricus*, E. Siberia, REITTER, Deutsche e. Z. 1891, p. 21, n. sp.

*Sericoderus basalis*, Sea of Aral, *flaviventris*, Tunis, REITTER, p. 20, Deutsche e. Z. 1891, n. spp.

## (B.) HYMENOPTERA.

"Clouds of Insects" supposed to be *Hymenoptera*; LAWTON, *Psyche*, vi, p. 180.

## ACULEATA.

[Cf. ALFKEN (7), BERG (51), CAMERON (129, 130, 337, 963), DEVAUX (184), DITTRICH (189), DOHRN (202), EMERY (240, 241, 242, 244), FABRE (252, 253), FERTON (277, 278), FOREL (290, 291), FOX (295, 296, 297, 298, 299), FRIESE (303, 304), FROGGATT (306, 307), GRIBODO (348, 349), HANDLIRSCH (371), KOHL (478), KOSCHEWNIKOFF (483), LUND (547), MEDINA (573), MORAWITZ (602), MURTFELDT (608), NICOLAS (622), PEREZ (646), PERKINS (647), RADOSZKOWSKI (673-677), ROBERTSON (739), SAUSSURE (760, 761), SCHLETTERER (772, 773), THOMSON (859), TOURNIER (860), TUCK (882), VACHAL (889), VERHOEFF (891, 892, 894, 899), WASMANN (927, 928, 930, 931, 933).]

Catalogue of described Australian *Hymenoptera*, part i; FROGGATT (306).

The first part of the volume devoted to *Hymenoptera* in Grandidier's work on the Natural History of Madagascar has appeared; see SAUSSURE (760).

## APIDÆ.

FRIESE gives much information as to the habits and nests of many species of solitary bees, with classification based on the pollen-collecting apparatus; Zool. Jahrb. v, Abth. Syst. pp. 751-860, pl. xlviii.

*Allodape ellioti*, Madagascar, SAUSSURE, in Grandidier Hist. Nat. Madagascar, xx, p. 79, pl. xxii, fig. 1, n. sp.

*Andrena*: effects of stylopisation; DOMINIQUE (206). *A. clarkella*, habits; ALFKEN, Verh. Deutsche Naturf. 1890, ii, p. 160.

*A. pruni*, *perezi*, p. 51, *sayi*, *erigeniæ*, p. 52, *violæ*, *salicis*, *erythronii*, p. 53, *geranii*, *polemonii*, *illinoiensis*, p. 54, *helianthi*, *solidaginis*, *zizii*, p. 55, *asteris*, *rudbeckiæ*, *cressonii*, p. 56, *pulchella*, *alicie*, *nuda*, p. 57, *rugosa*, *maricæ*, p. 58, *forbesii*, *claytoniæ*, p. 59, Illinois, ROBERTSON, Tr. Am. Ent. Soc. xviii, n. spp.

*Anthidium diadema*, *manicatum*, *florentinum*, habits; FABRE, Souvenirs, iv, chap. viii; *A. septemdentatum*, &c., id. chap. ix.

*Anthophora antimena*, p. 6, pl. i, fig. 7, *madécassa*, fig. 6, p. 8, *cyani-pennis*, fig. 5, p. 10, Madagascar, SAUSSURE, in Grandidier Hist. Nat. Madagascar, xx, n. spp.

*Apis mellifica*, sexual organs of male ; KOSCHIEWNIKOFF (483) : with one eye ; DITTRICH (189) : race from Tunis noticed ; KIRBY, p. xxvi, P. E. Soc. 1891. *A. unicolor*, described, pp. 1-4, figured, pl. i ; SAUSSURE, in Grandidier Hist. Nat. Madagascar, xx.

*Bombus* : synonymical and critical remarks on a large number of species, with special reference to the work of Radoszkowsky ; HANDLIRSCH, pp. 446-454, Ann. Hofmus. Wien, vi. *B. latreillelus*, varietal note, with n. var. *frisius*, p. 204 ; *B. terrestris*, n. var. *schmiedeknechti* ; *B. hypnorum*, n. var. *hofferi*, p. 205 ; VERHOEFF, B. E. Z. xxxvi. *B. distinguendus*, nest noticed ; ALFKEN, Verh. Deutsche Naturf. 1890, ii, p. 160. *B. terrestris*, in New Zealand ; THOMSON, N. Z. J. Sci. (n.s.) i, pp. 16-26.

*B. sardiniensis*, p. 222, *sassaricus*, p. 223, Sardinia, TOURNIER, L'Ent. Genev. i ; *B. simulus*, Sikkim, p. 114, *magrettii*, p. 115, *channicus*, Upper Burma, *sympophanta*, Caucasus or Turkestan, p. 116, *volucelloides*, Chiriqui, p. 119, GRIBODO, Bull. Ent. Ital. xxiii : n. spp.

*Centris quartinae*, p. 110, Venezuela, *proserpina*, Brazil, p. 111, *deiopiae*, Colombia, p. 112, GRIBODO, Bull. Ent. Ital. xxiii, n. spp.

*Ceratina caerulea* : habits ; VERHOEFF, p. 18, Verh. Ver. Rheinl. xlviii.

*Cilissa aegyptiaca*, n. n. for *tricincta*, Rad., *wankowiczi*, p. 237, *ruthenica*, p. 238, Minsk, *thoracica*, p. 239, *amurensis*, *media*, p. 240, *minor*, p. 241, Vladivostok, RADOSZKOWSKI, Hor. Ent. Ross. xxv, n. spp.

*Colletes* : descriptions and figures of the male organs ; RADOSZKOWSKI, Hor. Ent. Ross. xxv, pp. 249-261, pls. ii & iii.

*Colletes incerta*, *sidemii*, p. 252, *jankowskyi*, p. 253, Vladivostock, *mlokossewiczii*, p. 254, *fasciata*, Caucasus, *anceps*, p. 256, Caspian region, *mioceta*, no locality, p. 257, *carinata*, Askhabad, p. 258, *gallica* (= *fodiens*, Daws.), France, p. 259, RADOSZKOWSKI, Hor. Ent. Ross. xxv ; *C. spinosa*, *lutitarsis*, *willistoni*, p. 60, *heucherae*, *eulophi*, p. 61, *illinoisensis*, *speciosa*, *punctata*, *producta*, p. 62, Illinois, ROBERTSON, Tr. Am. Ent. Soc. xviii : n. spp.

*Crocisa sejuncta*, p. 81, pl. iii, fig. 16, *subcontigua*, p. 82, pl. iii, fig. 17, Madagascar, SAUSSURE, in Grandidier Hist. Nat. Madagascar, xx, n. spp.

*Ctenoplectra cornuta*, Upper Burma, GRIBODO, p. 102, Bull. Ent. Ital. xxiii, n. sp.

*Dasygoda wankowiczi*, Minsk, RADOSZKOWSKI, p. 244, Hor. Ent. Ross. xxv, n. sp.

*Epeolus ruthenicus*, Minsk, RADOSZKOWSKI, Hor. Ent. Ross. xxv, p. 245 ; *E. rufoclypeus*, Jamaica, FOX, p. 344, Tr. Am. Ent. Soc. xviii : n. spp.

*Halictus quadricinctus* : habits and nests ; VERHOEFF, pp. 61-71, Verh. Ver. Rheinl. xlviii.

*H. marchali*, France, VACHAL, p. 65, Rev. d'Ent. x, n. sp.

*Heriades philadelphi*, Illinois, ROBERTSON, p. 64, Tr. Am. Ent. Soc. xviii, n. sp.

*Lithurgus illudens*, Mauritius, SAUSSURE, p. 49, pl. iii, fig. 26, in Grandidier Hist. Nat. Madagascar, xx, n. sp.

*Macropis steironematis*, Illinois, ROBERTSON, p. 63, Tr. Am. Ent. Soc. xviii, n. sp.

*Megachile albocincta, sericans* : habits ; FABRE, Souvenirs, iv, chap. vii.

*M. leucopsis*, p. 6, *crocata*, p. 7, *xanthoptera*, p. 8, *pyrrhothorax*, p. 10, *adeloptera*, p. 11, *sparganotes*, p. 12. Congo, SCHLETTERER, Ann. Ent. Belg. xxxv ; *M. grandidieri*, Madagascar, p. 41, pl. iii, fig. 19, *morsitans*, p. 44, fig. 24, Mauritius, *piliceps*, p. 46, fig. 23, *albiscopa*, p. 47, pl. xix, fig. 2, *rufiscopa*, fig. 3, p. 48, SAUSSURE, in Grandidier Hist. Nat. Madagascar, xx ; *M. rufimanus*, Illinois, ROBERTSON, p. 65, Tr. Am. Ent. Soc. xviii ; *M. martindalei*, p. 344, *multidens*, p. 345, *pedalis*, p. 347, Jamaica, FOX, Tr. Am. Ent. Soc. xviii : n. spp

*Melanempis*, n. subg. of *Phileremus*, for *P. (M.) ater*, n. sp., Madagascar, pl. iii, fig. 18, SAUSSURE, p. 84, in Grandidier Hist. Nat. Madagascar, xx.

*Melecta sibirica*, Irkutsk, RADOSZKOWSKI, p. 246, Hor. Ent. Ross. xxv, n. sp., n. sp.

*Nomada bifida* : habits ; ALFKEN, Verh. Deutsche Naturf. 1890, ii, p. 161. *N. distinguenda* : habits ; VERHOEFF, p. 205, B. E. Z. xxxvi.

*N. excisa*, p. 193, *glaucoptis*, p. 194, S. W. France, PEREZ, Act. Soc. L. Bord. xlv, n. spp.

*Nomia notabilis*, p. 3, *brachysoma*, p. 5, Congo, SCHLETTERER, Ann. Ent. Belg. xxxv ; *N. oberthurella*, Zanzibar, p. 57, *bigibba*, p. 58, pl. xvii, fig. 4, *bicolor*, p. 61, pl. iii, fig. 27, *viridilimbata*, p. 64, figs. 28 & 29, *cuneata*, p. 66, pl. xvii, fig. 3, *scutellaris*, fig. 30, p. 68, *N. ? betsilei*, p. 71, pl. xvii, fig. 5, Madagascar, SAUSSURE, in Grandidier Hist. Nat. Madagascar, xx : n. spp.

*Osmia tricornis* : habits ; FABRE, Souvenirs, iv, chap. v, &c. *O. maritima* : habits, &c., noticed, p. 261, synonymical remarks on various other species, pp. 259-266 ; FRIESE, Ent. Nachr. xvii : also habits ; ALFKEN, Verh. Deutsche Naturf. 1890, ii, p. 161. *O. bicolor* : habits ; PERKINS, Ent. M. M. (2) ii, p. 193. *O. cornuta, fulviventris* : habits ; VERHOEFF, Verh. Ver. Rheinl. xlviii, pp. 71-73.

*O. rubicola*, Trieste, FRIESE, Ent. Nachr. xvii, p. 257 ; *O. saundersi*, Barbary, VACHAL, p. 66, Rev. d'Ent. x ; *Osmia fossoria*, p. 201, *fertonii*, p. 206, Algeria, PÉREZ, Act. Soc. L. Bord. xlv, with descriptions of habits by FERTON : n. spp.

*Pachymelus kova*, p. 16, pl. i, fig. 9, *cambouei*, p. 18, pl. xiv, fig. 1, *radove*, p. 20, pl. xvii, fig. 1, *limbatus*, p. 21, pl. i, fig. 13, *ocularis*, p. 24, fig. 15, *heydenii*, p. 25, fig. 8, *bicolor*, p. 27, fig. 14, *unicolor*, p. 28, figs. 11 & 12, Madagascar, SAUSSURE, in Grandidier Hist. Nat. Madagascar, xx, n. spp.

*Phileremides* : composition of the group, with synonymical notes ; DALLA TORRE, Wien. ent. Z. x, pp. 113 & 114.

*Phileremus* : see also *Melanempis*.

*Phileremus illinoiensis*, N. America, ROBERTSON, p. 64, Tr. Am. Ent. Soc. xviii, n. sp.

✓ *Pseudocilissa*, n. g., for *Cilissa robusta*, Rad.; RADOSZKOWSKI, p. 241, Hor. Ent. Ross. xxv.

*Pseudomelecta kuschakewiczi*, Vernoë, RADOSZKOWSKI, Hor. Ent. Ross. xxv, p. 247, n. sp.

*Psithyrus bellardii*, Upper Burma, GRIBODO, p. 108, Bull. Ent. Ital. xxiii, n. sp.

*Prosopis gazagnairei*, Barbary, p. 63, *fertoni*, Algeria, p. 64, VACHAL, Rev. d'Ent. x, n. spp.

*Sphecodes antennariæ*, Illinois, ROBERTSON, p. 63, Tr. Am. Ent. Soc. xviii, n. sp.

✓ *Sphegocephala*, n. g. (*Andreniens*), p. 74, for *S. philanthoides*, n. sp., Madagascar, p. 76, pl. xvii, fig. 6; SAUSSURE, in Grandidier Hist. Nat. Madagascar, xx.

✓ *Thrinchostoma*, n. g., *Andreniens*, p. 52, for *T. renitantely*, n. sp., Madagascar; SAUSSURE, p. 54, pl. iii, fig. 25, in Grandidier Hist. Nat. Madagascar, xx.

*Trigona erythra*, Congo, SCHLETTERER, p. 2, Ann. Ent. Belg. xxxv; *T. madecassa*, Madagascar, SAUSSURE, p. 4, pl. i, fig. 3, in Grandidier Hist. Nat. Madagascar, xx; *T. javanica*, Japan, GRIBODO, p. 109, Bull. Ent. Ital. xxiii : n. spp.

*Xenoglossa ipomææ*, Illinois, ROBERTSON, p. 65, Tr. Am. Ent. Soc. xviii, n. sp.

*Xylocopa simplicipes*, Madagascar, SAUSSURE, p. 34, pl. i, fig. 4, Grandidier Hist. Nat. Madagascar, xx; *X. pentacromo*, Celebes, p. 104, *ghilianii*, Mindanao, p. 106, *trifasciata*, p. 107, Mindanao, GRIBODO, Bull. Ent. Ital. xxiii : n. spp.

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*Chartergus fraternus*, Brazil, p. 255, *concolor*, Venezuela, p. 257, GRIBODO, Bull. Ent. Ital. xxiii, n. spp.

*Eumenes pensilis*, Madagascar, SAUSSURE, p. 155, pl. iv, fig. 10, & pl. xvii, fig. 7, in Grandidier Hist. Nat. Madagascar, xx, n. spp.

*Icuvia schulthessi*, p. 117, pl. xviii, fig. 14, *atra*, p. 119, *grandidieri*, p. 120, pl. iv, fig. 5, *nitidula*, pl. xviii, fig. 17, *carinata*, p. 122, *scottiana*, p. 124, *madecassa*, = (*gallimathias*, Sauss., olim), p. 125, pl. xviii, fig. 16, *ignobilis*, p. 127, pl. iv, fig. 7, *velutina*, p. 129, pl. iv, fig. 4, *vitripennis*, p. 130, *hova*, p. 131, pl. iv, fig. 2, *subclavata*, p. 134, pl. iv, fig. 6, *variabilis*, p. 135, pl. xviii, fig. 15, *bicincta*, p. 136, pl. iv, fig. 3, Madagascar, *antennata*, Mozambique, p. 136, *ranavali*, p. 138, pl. xviii, fig. 18, Madagascar, SAUSSURE, in Grandidier Hist. Nat. Madagascar, xx; *I. marangensis*, p. 243, *fulvipennis*, p. 245, Sumatra, *aberrans*, India, p. 246, GRIBODO, Bull. Ent. Ital. xxiii : n. spp.

*Labus floricola*, Madagascar, SAUSSURE, p. 151, pl. xxii, fig. 3, in Grandidier Hist. Nat. Madagascar, xx, n. sp.

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*Nectarina augusti*, description amended; GRIBODO, p. 254, Bull. Ent. Ital. xxiii.

*N. chartergoides*, Cayenne, GRIBODO, p. 253, Bull. Ent. Ital. xiii, n. sp.

*Nortonia schulthessiana*, Madagascar, SAUSSURE, in Grandidier Hist. Nat. Madagascar, p. 157, pl. xvii, fig. 8, n. sp.

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*O. buyssoni*, Andalusia, MEDINA, p. 106, An. Soc. Esp. xx; *O. (Ancistrocerus) xanthosoma*, p. 24, *O. (L.) goniodes*, p. 25, *bothriogaster*, p. 27, Congo, SCHLETTERER, Ann. Ent. Belg. xxxv; *O. grandidieri*, p. 164, pl. iv, fig. 16, *hildebrandti*, p. 166, pl. xvii, fig. 10, Madagascar, *andreas*, p. 167, pl. xix, fig. 4, *sakalavus*, p. 169, pl. xxii, fig. 4, Nossi Bé, SAUSSURE, in Grandidier Hist. Nat. Madagascar, xx; *O. hyacinthe*, p. 290, *bairstowi*, p. 292, *emeryanus*, p. 293, W. Africa, *freundens*, Port Elizabeth, p. 294, *aruanus*, Aru Is., p. 297, note, *laminiger*, Borneo, p. 299, GRIBODO, Bull. Ent. Ital. xxiii; *O. (Leionotus) fairmairei*, p. 83, *rhachiphorus*, p. 85, *psilothorax*, p. 87, *cyrtogaster*, p. 89, *rhodopterus*, p. 92, Chili, SCHLETTERER, Ent. Nachr. xvii : n. spp.

✓*Paraicaria*, n. g., p. 248, for *P. bicolor*, n. sp., Upper Burma, p. 249; GRIBODO, Bull. Ent. Ital. xxiii.

*Polistes spilophora*, Congo, SCHLETTERER, p. 29, Ann. Ent. Belg. xxxv; *P. incertus*, p. 145, pl. iv, fig. 9, *albicinctus*, p. 148, pl. xviii, fig. 21, Madagascar, SAUSSURE, in Grandidier Hist. Nat. Madagascar, xx : n. spp.

*Polybia sycophanta*, Brazil, GRIBODO, p. 251, Bull. Ent. Ital. xxiii, n. sp.

*Pterocheilus spinipes*, biology; VERHOEFF, pp. 40-57, Verh. Ver. Rheintl. xlviii. *P. levipes*, habits, structure of larva; VERHOEFF, pp. 15 & 16, t. c.

*Rhygchium ceperoi*, Andalusia, MEDINA, p. 105, An. Soc. Esp. xx; *R. chrysomallum*, Congo, SCHLETTERER, p. 23, Ann. Ent. Belg. xxxv; *R. giannellii*, Brazil, p. 278, *anceps*, p. 280, *mephisto*, p. 283, W. Africa, *bicoloripenne*, Pulo-Laut, p. 286, *laminatum*, Celebes, p. 288, GRIBODO, Bull. Ent. Ital. xxiii : n. spp.

✓*Stroudia*, n. g., *Zethides*, p. 262, for *S. armata*, n. sp., S. Africa, p. 264, GRIBODO, Bull. Ent. Ital. xxiii.

*Synagris proserpina*, Zanzibar, GRIBODO, p. 265, Bull. Ent. Ital. xxiii; *S. tropidia*, p. 20, *odontophora*, p. 21, CONGO, SCHLETTERER, Ann. Ent. Belg. xxxv : n. spp.

*Tutua quadratuberculata*, Saryacu, GRIBODO, p. 251, Bull. Ent. Ital. xxiii, n. sp.

*Vespa*: habits of the British species; TUCK, Field Club, ii, pp. 25, &c. *V. germanica*, habits; MARLATT, P. E. Soc. Wash. ii, pp. 80-83. *V. cincta*, larva described; LUCAS, p. cxviii, Bull. Soc. Ent. Fr. 1891. *V. crabro*, n. var. *anglica*; GRIBODO, p. 242, Bull. Ent. Ital. xxiii.

*Zethus gigas*, ♂ described; GRIBODO, p. 259, Bull. Ent. Ital. xxiii.

*Z. (Calligaster) javanus*, E. Java, GRIBODO, p. 261, Bull. Ent. Ital. xxiii, n. sp.

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*Agenia punctum*, *hyalipennis*, habits; FABRE, Souvenirs, iv, chap. ii, *A. carbonaria*, larva and its structure described; VERHOEFF, pp. 32-37, Verh. Ver. Rheinl. xlviii.

*A. vittipennis*, *subsessilis*, *macula*, *bivittata*, p. 264 *marginipennis*, *apicalis*, *A. ? vidua*, p. 265, Madagascar, SAUSSURE, MT. Schw. ent. Ges. viii; *A. compressa*, Jamaica, FOX, p. 340, Tr. Am. Ent. Soc. xviii: n. spp.

*Ammophila* sp., habits; FABRE, Souvenirs, iv, chap. xii. *A. robusta*, habits; ALDRICH, p. 136, Canad. Ent. xxxiii.

*A. kirgisica*, p. 203, *separanda*, p. 204, Astrakhan, MORAWITZ, Hor. Ent. Ross. xxv; *A. auromaculata*, Gran Chaco, PÉREZ, Mém. Soc. Zool. iv, p. 499: n. spp.

*Ampulex ruficornis*, mimic of *Sima rufo-nigra*; ROTHNEY, p. xi, P. E. Soc. 1891.

*Aporus cotesi*, pl. iii, fig. 2, *bengalensis*, E. India, CAMERON, p. 478, Mem. Manch. Soc. iv (4), n. spp.

*Bembex rostrata*, habits, paralysis of its prey, &c.; LUND, Ent. Medd. iii, pp. 19-44.

*B. kirgisica*, p. 225, *planifrons*, p. 227, Astrakhan, MORAWITZ, Hor. Ent. Ross. xxv; *B. madecassa*, *crinita*, *militaris*, Madagascar, SAUSSURE, p. 260, MT. Schw. ent. Ges. viii: n. spp.

*Bothynostethus distinctus*, New Jersey, FOX, Ent. News, ii, p. 31, n. sp.

*Oalicurgus* sp., habits; FABRE, Souvenirs, iv, chap. xiv.

*Cerceris caspica*, p. 213, *charusini*, p. 215, Astrakhan, MORAWITZ, Hor. Ent. Ross. xxv; *C. petiolata*, *formidolosa*, *hildebrandti*, p. 261, *paleata*, *perfida*, *spinifrons*, p. 262, Madagascar, SAUSSURE, MT. Schw. ent. Ges. viii; *C. amaura*, Congo, KOHL, p. 16, Ann. Ent. Belg. xxxv; *C. sonorensis*, Mexico, CAMERON, p. 129, pl. viii, fig. 10, Biol. Centr. Am. Hym. ii: n. spp.

*Ceropales agilis*, figured; Biol. Centr. Am. Hym. ii, pl. x, fig. 1.

*C. sabulosa*, Astrakhan, MORAWITZ, p. 184, Hor. Ent. Ross. xxv; *C. orientalis*, pl. iii, fig. 4, p. 432, *claripennis*, p. 433, *annulitarsis*, p. 434, E. India, CAMERON, Mem. Manch. Soc. iv (4); *C. azteca*, pl. x, fig. 2, p. 159, *fumipennis*, fig. 3, *chiriquensis*, fig. 4, p. 160, *apicipennis*, fig. 5, p. 161, Central America, CAMERON, Biol. Centr. Am. Hym. ii: n. spp.

*Chevrieria unicolor*: habits discussed; VERHOEFF, pp. 12 & 13, Verh. Ver. Rheinl. xlviii.



*Chlorion forficula*, Madagascar, SAUSSURE, p. 259, MT. Schw. ent. Ges. viii, n. sp.

*Crabro chrysostomus*: habits, larvæ, and ♂ ♀ pupæ described, pp. 22-29; *quadrimaculatus*: habits noticed, p. 29; VERHOEFF, Verh. Ver. Rheinl. xlviii.

*C. sambucicola*, Germany, VERHOEFF, p. 147, Ent. Nachr. xvii; *C. pluschtscherskyi*, Astrakhan, MORAWITZ, p. 229, Hor. Ent. Ross. xxv; *C. saxatilis*, pl. ix, fig. 1, *championi*, fig. 2, p. 142, *attilanæ*, fig. 3, p. 143, *sonorensis*, fig. 4, p. 144, *montivagus*, fig. 5, p. 145, *centralis*, fig. 6, p. 146, *ariel*, fig. 7, *hector*, fig. 8, p. 147, *costaricensis*, fig. 9, p. 148, *constanceæ*, fig. 10, p. 149, *guerrensis*, fig. 11, *yucateensis*, fig. 12, p. 150, *montezuma*, fig. 13, p. 151, *alpestris*, fig. 14, *alticola*, fig. 15, p. 152, *fulvohirtus*, fig. 17, p. 153, *maculitarsis*, fig. 18, p. 154, *jason*, fig. 19, p. 155, Central America, CAMERON, Biol. Centr. Am. Hym. ii, n. spp.

*Cyphononyx (Schistonyx) decorata*, Madagascar, SAUSSURE, p. 268, MT. Schw. ent. Ges. viii, n. sp.

*Elis (Trielis) punctum*, *elliottiana*, p. 254, *E. (Dielis) barbata*, p. 255, Madagascar, SAUSSURE, MT. Schw. ent. Ges. viii, n. spp.

*Eucerceris cerceriformis*, Mexico, CAMERON, p. 130, Biol. Centr. Am. Hym. ii, n. sp.

*Ferreola thoracica*, redescribed; MORAWITZ, p. 186, Hor. Ent. Ross. xxv.

*Gorytes floridanus*, n. n. for *Hoplisus foveolatus*, Fox; Fox, p. 196, Ent. News, ii.

*Homonotus nuculipes*, p. 263, *ibex*, p. 264, Madagascar, SAUSSURE, MT. Schw. ent. Ges. viii, n. spp.

*Larra proditor*, Congo, KOHL, p. 15, Ann. Ent. Belg. xxxv; *L. aurantia*, *punctifrons*, N. America, Fox, Ent. News, ii, p. 194: n. spp.

*Miscophus metallicus*, Verh., larva described; VERHOEFF, pp. 30-32, Verh. Ver. Rheinl. xlviii; *M. americanus*, ♂ described; Fox, Ent. News, ii, p. 196.

*Mimesa breviventris*, p. 205, *atratina*, p. 206, Astrakhan, MORAWITZ, Hor. Ent. Ross. xxv; *M. mexicana*, pl. viii, fig. 15, p. 134, *pulchra*, fig. 16, p. 135, *striolata*, fig. 17, p. 136, *longiventris*, fig. 18, *monticola*, fig. 19, p. 137, *montezuma*, p. 138, *claviventris*, fig. 20, p. 139, Central America, CAMERON, Biol. Centr. Am. Hym. ii: n. spp.

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*Myzine nitida*, ♀ described; Fox, Tr. Am. Ent. Soc. xviii, p. 338.

*Notogonia radamæ*, *ancara*, p. 260, *avellanipes*, *heidemii*, p. 261, Madagascar, SAUSSURE, MT. Schw. ent. Ges. viii, n. spp.

*Oxybelus acuticornis*, p. 209, *pictipes*, p. 210, *varians*, p. 211, Astrakhan, MORAWITZ, Hor. Ent. Ross. xxv; *O. bugabensis*, pl. ix, fig. 20, p. 156, *longispina*, fig. 21, *aztecus*, fig. 22, p. 157, *argenteo-pilosus*, fig. 23, p. 158, Central America, CAMERON, Biol. Centr. Am. Hym. ii: n. spp.

*Passalæcus turionum*, larva described, habits, pp. 5-8, *gracilis*, *brevicornis*, habits, pp. 8 & 9; VERHOEFF, Verh. Ver. Rheinl. xlviii.

*Pelopæus*, sp.: habits in Southern France; FABRE, *Souvenirs*, iv, chap. i-iii.

*Pemphredon*, habits, larva, and pupa noticed; VERHOEFF, pp. 19-22, *Verh. Ver. Rheinl.* xlviii.

*Philanthus*, synonymical catalogue of the described species; KOHL, pp. 363-370, *Ann. Hofmuseum Wien*, vi. *P. apivorus*, habits; FABRE, *Souvenirs*, iv, chap. xi. *P. vertilabris*, figured, pl. viii, fig. 11; *Biol. Centr. Am. Hym.* ii.

*P. bimacula*, Madagascar, SAUSSURE, p. 261, *MT. Schw. ent. Ges.* viii; *P. (Philoponus) angelæ*, Bagdad, p. 346, *araxis*, Caucasus, p. 347, *P. glaber*, Siberia, p. 348, *genalis*, Libyan desert, *consimilis*, p. 349, *major*, p. 353, Cape Good Hope, *nobilis*, p. 354, *angustifrons*, p. 355, Caucasus, *rugosus*, Cape Good Hope, p. 357, *minor*, Egypt, p. 358, *impatiens*, Cape Good Hope, p. 359, *walteri*, Transcaspian region, *distinguendus*, Egypt, p. 361, KOHL, *Ann. Hofmuseum Wien*, vi; *P. xanthostigma*, pl. viii, fig. 12, p. 131, *maculifrons*, fig. 13, p. 132, *multimaculatus*, fig. 14, p. 133, Mexico, CAMERON, *Biol. Centr. Am. Hym.* ii: n. spp.

*Planiceps orientalis*, E. India, CAMERON, p. 477, pl. iii, fig. 1, *Mem. Manch. Soc.* iv (4); *P. euferalis*, Jamaica, FOX, p. 341, *Tr. Am. Ent. Soc.* xviii: n. spp.

*Pompilides*: stinging spiders; FERTON, *Act. Soc. L. Bord.* xlv, p. 281.

*Pompilius*: TOURNIER continues tabulation of the European *Pompilidae*, with many species that may be possibly new; *L'Ent. Genev.* i, pp. 194-219. *P. caliptera*, Say, referred to *Agenia*; FOX, p. 196, *Ent. News*, ii.

*P. bifidus*, p. 190, *distinguendus*, p. 191, *brevigena*, p. 192, *nudipes*, p. 193, *breviscapus*, p. 195, *leucurus*, p. 196, *pedicellaris*, p. 197, *cardinalis*, p. 198, Astrakhan, MORAWITZ, *Hor. Ent. Ross.* xxv; *P. pannelas*, *betsilei*, *fallax*, *lutarius*, p. 265, *cadmius*, *plebeius*, p. 266, Madagascar, SAUSSURE, *M.T. Schw. ent. Ges.* viii; *P. circe*, pl. iii, fig. 5, pp. 457 & 461, *pedulis*, p. 461. *P. (Ferrolea) ariadne*, pl. iii, fig. 7, *hecate*, fig. 8, p. 462, *P. (F. ?) rothneyi*, fig. 9, p. 463, *P. wroughtoni*, fig. 10, p. 464, *delhiensis*, fig. 11, p. 465, *hero*, fig. 12, p. 466, *incognitus*, fig. 13, p. 467, *vivax*, fig. 14, p. 468, *vischnu*, p. 469, *electus*, fig. 15, p. 470, *buddha*, fig. 20, p. 471, *zeus*, fig. 21, p. 472, *beatus*, fig. 22, p. 473, *detectus*, fig. 25, p. 474, *lascivus*, fig. 26, *zebra*, fig. 27, p. 475, *parenthope*, p. 476, E. India, CAMERON, *Mem. Manch. Soc.* iv (4); *P. propinquus*, *aneo-purpureus*, Jamaica, FOX, p. 339, *Tr. Am. Ent. Soc.* xviii: n. spp.

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*Pseudagenia alaris*, Saus., and *festinata*, Sm., are one species, figured, pl. iii, fig. 3; CAMERON, p. 439, Mem. Manch. Soc. iv (4).

*P. ochropus*, Congo, KOHL, p. 18, Ann. Ent. Belg. xxxv; *P. ariel*, p. 439, *veda*, p. 440, E. India, CAMERON, Mem. Manch. Soc. iv (4); *P. cressoni*, pl. x, fig. 6, p. 161, *curvinervis*, fig. 7, p. 162, *incognita*, fig. 8, p. 163, *montivaga*, fig. 9, p. 164, *gentilis*, fig. 10, *isthmica*, fig. 11, p. 165, *championi*, fig. 12, p. 166, *tolteca*, fig. 14, *collina*, fig. 13, p. 167, *perdita*, fig. 16, p. 168, *extrema*, fig. 15, *teapæ*, fig. 17, p. 169, *utilis*, *relativa*, p. 170, *azteca*, p. 171, *melanocephala*, fig. 18, *tabascoensis*, fig. 19, p. 172, Central America, CAMERON, Biol. Centr. Am. Hym. ii: n. spp.

*Rhinopsis constancea*, Poona, CAMERON, p. 192, pl. i, fig. 6, Mem. Soc. Manch. (4) iv, n. sp.

*Rhopalum clavipes*, habits of larva, mode of exit; VERHOEFF, p. 4, pl. i, fig. 4, Verh. Ver. Rheinl. xlviii.

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*Sphecius speciosus*, habits; RILEY, P. E. Soc. Wash. ii, p. 71: structure of cocoon; RILEY, p. 256, Canad. Ent. xxiii.

*Sphex magnificum*, *superbum*, *melanosoma*, *splendidum*, synonymy noticed, *montanus* and *occitanicus*, considered valid; MORAWITZ, p. 234 & 235, Hor. Ent. Ross. xxv.

*S. stanleyi*, Congo, KOHL, p. 14, Ann. Ent. Belg. xxxv; *S. abbotii*, Kilimanjaro, Fox, Ent. News, ii, p. 42; *S. madegassus*, *leoninus*, Madagascar, SAUSSURE, p. 259, MT. Schw. ent. Ges. viii: n. spp.

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*Stigmus pendulus*, habits described; VERHOEFF, pp. 9-12, Verh. Ver. Rheinl. xlviii. *S. podagricus*, figured, pl. viii, fig. 22, Biol. Centr. Am. Hym. ii.

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EMERY gives synonymical notes as to the species described by the following writers—NIEBUHR, CHRIST, OLIVIER, LEACH, JERDON, MOTSCHOUJSKY, SMITH, JORDAN; Bull. Ent. Ital. xxiii, pp. 159-167.

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*Dorylides* : composition of the subfamily, and sexual forms therein ; FOREL, Verh. Deutsche Naturf. 1890, ii, pp. 162-164.

*Amblyopone pallipes*, note on ; HARRINGTON, Canad. Ent. xxiii, p. 138.

*Anomma* : the described species are all varr. of *A. burmeisteri* ; EMERY, pp. 553-555, Ann. Soc. Ent. Fr. 1891.

*Atopomyrmex cryptoceroides*, W. Africa, EMERY, p. 561, pl. xv, figs. 5 & 6, Ann. Soc. Ent. Fr. 1891, n. sp.

*Camponotus mayri*, Ecuador, CAMERON, in Whympers Supp. App. p. 89, n. sp.

*Cutaulacus guineensis*, race *sulcinodis*, n. st. ; EMERY, p. 563, pl. xv, fig. 8, Ann. Soc. Ent. Fr. 1891.

↓ *Champsomyrmex*, n. g., for *Odontomachus coquereli*, Rog. ; EMERY, p. 558, Ann. Soc. Ent. Fr. 1891.

√ *Cratomyrmex*, n. g., near *Pogonomyrmex*, for *C. regalis*, n. sp., W. Africa, pl. xv, fig. 16 ; EMERY, p. 572, Ann. Soc. Ent. Fr. 1891.

*Dorylus affinis*, Shuck., = (*ægyptiacus*, Mayr) ; EMERY, p. 570, Ann. Soc. Ent. Fr. 1891.

*D. gribodoi*, W. Africa, EMERY, p. 570, pl. xv, fig. 15, Ann. Soc. Ent. Fr. 1891, n. sp.

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*Pheidole monticola*, Ecuador, CAMERON, in Whympers Supp. App. p. 93, n. sp.

*Plectroctena minor*, W. Africa, EMERY, p. 556, pl. xv, figs. 1 & 2, Ann. Soc. Ent. Fr. 1891, n. sp.

*Polyrhachis militaris*, race *striativentris*, n. st. ; EMERY, p. 566, Ann. Soc. Ent. Fr. 1891.

*P. alluaudi*, W. Africa, EMERY, p. 567, pl. xv, figs. 9 & 10, Ann. Soc. Ent. Fr. 1891, n. sp.

*Rhogmus fuscipennis*, W. Africa, EMERY, p. 570, Ann. Soc. Ent. Fr. 1891, n. sp.

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<sup>1</sup>*Stauropactonus*, n. g., for *Ophion bombycivorus*, Grav. ; BRAUNS, p. 93, Arch. Ver. Mecklenb. xliii.

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*Microplitis cincta*, Canada, ASHMEAD, p. 3, Canad. Ent. xxiii, n. sp.

*Opiides* : remarks on the genera of, merging many of Förster's genera in *Opius* and *Biosteres* ; MARSHALL, Tr. E. Soc. 1891.

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 BIGNELL, Ent. M. M. (2) ii, p. 169.

*Praon* : mode of pupation ; HOWARD, p. 196, fig. 21, *Ins. Life*, iv.

*Rhogas mellipes*, Canada, ASHMEAD, p. 3, Canad. Ent. xxiii, n. sp.

*Spathius canadensis*, Canada, ASHMEAD, p. 2, Canad. Ent. xxiii, n. sp.

### EVANIIDÆ and STEPHANIDÆ.

*Evania annulata*, Java, p. 11, *concolor*, New Freiburg, *curvipes*, p. 12,  
*rufa*, Tucuman, p. 13, *hirsuta*, Brazil, *festiva*, New Freiburg, p. 14,  
 TASCHENBERG, B. E. Z. xxxvi, n. spp.

*Gasteruption schletteri*, no locality, *rubrum*, Mendoza, p. 15, *sordidum*,  
 New Holland, p. 16, TASCHENBERG, B. E. Z. xxxvi, n. spp.

*Stephanus turcomanorum*, Transcaspian region, SEMENOW, p. 435, Hor.  
 Ent. Ross. xxv, n. sp.

### CHALCIDIDÆ.

Methods of pupation ; HOWARD, *Ins. Life*, iv, pp. 193-196, figs. 16-21.

*Aphelinus theæ*, from *Aspidiotus theæ* in India, CAMERON, p. 183, pl. i,  
 fig. 5, Mem. Soc. Manch. (4) iv, n. sp.

*Chalcis responsata*, Wlk. ; *C. criculæ*, KOHL, is probably this species ;  
 KIRBY, p. 45, Ind. Mus. Notes, ii.

*Chalcidura bedeli*, Algeria, CAMERON, p. 188, pl. i, figs. 8 & 9, Mem. Soc.  
 Manch. (4) iv, n. sp.

*Ohrysocharis singularis*, mode of pupation ; HOWARD, *Ins. Life*, iv,  
 p. 194, fig. 18.

*Cratotechus* sp., pupation figured ; HOWARD, p. 195, fig. 19, *Ins. Life*,  
 iv.

*Decatoma betæ*, France, DECAUX, p. cliii, Bull. Soc. Ent. Fr. 1891, n. sp.

*Eucharis myrmiciæ*, Australia, parasitic on *Myrmecia forficata* ; CAMERON,  
 p. 187, pl. i, fig. 10, Mem. Soc. Manch. (4) iv, n. sp.

*Eurytoma*, parasitic habits of ; HOWARD, P. E. Soc. Wash. ii, p. 66.

✓ *Hexacladia*, n. g., *Encyrtinæ*, p. 456, for *H. smithii*, n. sp., Chapada,  
 p. 457, & fig. 35, p. 455 ; ASHMEAD, *Ins. Life*, iii.

*Homalotylus obscurus*, pupation figured ; HOWARD, *Ins. Life*, iv, p. 193,  
 fig. 17.

*Leucospis tricarinata*, Congo, SCHLETTERER, p. 31, Ann. Ent. Belg.  
 xxxv, n. sp.

*Pachyneuron* : the habits of the N. American species ; HOWARD, P. E.  
 Soc. Wash. ii, pp. 105-109.

*Pteromalus oryzæ*, from *Calandra oryzæ*, in India ; CAMERON, p. 184,  
 pl. i, fig. 2, Mem. Soc. Manch. (4) iv, n. sp.

*Semiotellus nigripes*, imported into N. America ; FORBES (289).

†*Sternodes*, n. g. (*Eucharides*), for *S. pusateri*, n. sp., Sicily ; STEFANI, Nat. Sicil. x, p. 118.

#### PROCTOTRUPIDÆ.

*Acoloides emertonii*, N. America, HOWARD, *Ins. Life*, iv, p. 202, n. sp.

*Anectata dispar*, Danzig, BRISCHKE, *Schr. Ges. Danz.* (2) vii, pt. iv, p. 28, n. sp.

*Ooctonus seefelderianus*, Sicily, STEFANI, Nat. Sicil. x, p. 119, n. sp.

*Platygaster oryza*, from *Cecidomyia oryza*, in India, CAMERON, p. 182, pl. i, fig. 7, *Mem. Soc. Manch.* (4) iv, n. sp.

*Telenomus melanogaster*, p. 189, *T. (Phanurus) amazonica*, p. 190, pl. i, fig. 4, Amazon Valley, from eggs of bugs, CAMERON, *Mem. Soc. Manch.* (4) iv, n. spp.

#### CYNIPIDÆ.

Jumping galls ; ASCHERSON (18).

*Cynipid*-galls of Lorraine ; KIEFFER (466).

*Acraspis compressus*, Iowa, GILLETTE, p. 197, *Bull. Illin. Lab. N. H.* iii, n. sp.

*Antistrophus silphii*, p. 192, *laciniatus*, p. 194, *rufus*, p. 195, *minor*, p. 196, *bicolor*, p. 197, Illinois, GILLETTE, *Bull. Illin. Lab. N. H.* iii, n. spp.

*Aulax kernerii*, Vienna, WACHTL, *Wien. ent. Z.* x, p. 277, pl. ii ; *A. bicolor*, Illinois, GILLETTE, p. 201, *Bull. Illin. Lab. N. H.* iii : n. spp.

*Blastophaga psenes* introduced to California ; EISEN, *Zoe*, ii, p. 114.

*Chilaspis ferrugineus*, Iowa, GILLETTE, p. 200, *Bull. Illin. Lab. N. H.* iii, n. sp.

*Coptereucoila marginata*, Illinois, GILLETTE, p. 204, *Bull. Illin. Lab. N. H.* iii, n. sp.

*Diastrophus scutellaris*, Illinois, GILLETTE, *Bull. Illin. Lab. N. H.* iii, p. 191, n. sp.

*Dryophanta lanata*, Iowa, GILLETTE, p. 198, *Bull. Illin. Lab. N. H.* iii, n. sp.

*Eucolia 7-spinosa*, Illinois, GILLETTE, p. 204, *Bull. Illin. Lab. N. H.* iii, n. sp.

*Eucoilidea rufipes*, N. America, GILLETTE, p. 205, *Bull. Illin. Lab. N. H.* iii, n. sp.

*Ibalia drewseni*, Denmark, BORRIES, *Ent. Medd.* iii, p. 57, n. sp.

*Onychia* sp., noticed, p. 249, figured, pl. iv, fig. 2 ; RILEY, *Rep.* 1890.

*Synergus magnus*, Michigan, *villosus*, Iowa, GILLETTE, p. 202, *Bull. Illin. Lab. N. H.*, n. spp.

#### SESSILIVENTRES.

[*Cf.* CAMERON (129), DOMINIQUE (205), FABRE (252), FOCKEU (286), GASPERINI (323), JACK (433), KIEFFER (466), KONOW (480, 481), KRIECHBAUMER (496), MARLATT (561), MOCSÁRY (596), NERÉN (611), RILEY & MARLATT (727), SEMENOW (796), TOURNIER (860).]

## SIRICIDÆ and CEPHIDÆ.

*Cephus melanarius*, Greece, MOCSÁRY, p. 158, Term. füzetek, xiv ; *C. occidentalis*, California, RILEY & MARLATT, *Ins. Life*, iv, p. 177, fig. 15, n. sp.

*Sirex augur*, Klug : habits and instinct of larva ; FABRE, *Souvenirs*, iv, chap. xviii. *S. gigas* injurious in Ireland ; ORMEROD, *Rep.* 1890, p. 122 : abundance near Dublin ; LEECH, *Ent.* xxiv, p. 248.

*S. leseleuci*, Finistère, TOURNIER, *L'Ent. Genev.* i, p. 220 ; *S. carinthiacus*, Carinthia, KONOW, p. 210, *Deutsche e. Z.* 1891 : n. spp.

*Tremex hyalinatus*, Gaboon, MOCSÁRY, p. 158, Term. füzetek, xiv, n. sp.

*Xiphydria cyanea*, Java, MOCSÁRY, p. 158, Term. füzetek, xiv, n. sp.

## TENTHREDINIDÆ.

Supplement to Catalogue of European *Tenthredinidæ*, with synonymical remarks ; KONOW, pp. 209–220, *Deutsche e. Z.* 1891.

Observations on the final moulting of *Tenthredinid* larvæ ; MARLATT, *P. E. Soc. Wash.* ii, pp. 115–117.

Notes on Tenthredinous galls on willows ; FOCKEU (286). *Tenthredinid* galls of Lorraine ; KIEFFER (466).

*Allantus limbiferus*, Caucasus, MOCSÁRY, p. 156, Term. füzetek, xiv ; *A. lautus*, Caucasus, KONOW, p. 47, *Wien. ent. Z.* x ; *A. violaceipennis*, Armenia, COSTA, p. 16, pl. iii, fig. 6, *Atti Acc. Napoli* (2) iv, No. 5 ; *A. jakolewi*, Bukhara, KONOW, p. 218, *Deutsche e. Z.* 1891 : n. spp.

*Arge auripennis*, p. 41, *annulata*, p. 42, Caucasus, KONOW, *Wien. ent. Z.* x, n. spp.

*Athalia schweinfurthi*, Arabia, KONOW, p. 41, *Wien. ent. Z.* x ; *A. dimidiata*, Caucasus, *id.* p. 42, *t. c.* : n. spp.

*Blennocampa lugubripennis*, pl. iii, fig. 3, *candidipes*, Greece, COSTA, *Atti Acc. Napoli* (2) iv, No. 5, p. 8, n. spp.

*Cladius ordubadensis*, Caucasus, p. 211, *palmicornis*, Algeria, p. 212, KONOW, *Deutsche e. Z.* 1891, n. spp.

*Cyphona albipennis*, Caucasus, KONOW, p. 42, *Wien. ent. Z.* x, n. sp.

*Dolerus arvensis*, *collaris*, &c. : larvæ described ; RILEY & MARLATT, *Ins. Life*, iv, pp. 171–174.

*D. nigriceps*, Caucasus, p. 44, *ciliatus*, Russia, p. 45 ; KONOW, *Wien. ent. Z.* x, n. spp.

*Emphytus* : habits of the Scandinavian species, with description of the larva of *E. filiformis*, Klug ; NERÉN, *Ent. Tidskr.* xii, pp. 5–14. *E. cingillum*, Kl., habits of larva ; VERHOEFF, p. 3, *Verh. Ver. Rheinl.* xlviii.

*E. leucostomus*, Greece, COSTA, p. 6, *Atti Acc. Napoli* (2) iv, No. 5 ; *E. geminus*, Caucasus, KONOW, p. 43, *Wien. ent. Z.* x : n. spp.

*Eriocampa alabastripes*, Greece, COSTA, p. 9, *Atti Acc. Napoli* (2) iv, No. 5, p. 9, n. sp.

*Hennedyia*, n. g., near *Athalia*, p. 190, for *H. annulitarsis*, pl. i, fig. 1, n. sp., Gibraltar, p. 191, CAMERON, *Mem. Soc. Manch.* (4) iv.

*Hylotoma pectoralis*, ♂ described, p. 10, *scapularis*, *mcleayi*, larvæ, p. 11 ; JACK, *Psyche*, vi.

*H. cyanura*, Armenia, COSTA, p. 15, pl. iii, fig. 5, Atti Acc. Napoli (2) iv, No. 5 ; *H. schmiedeknechti*, Greece, *id. t. c. p.* 3, pl. iii, fig. 1 : n. spp.

*Laurentia*, n. g., near *Pristiphora*, for *L. craverii*, n. sp., Italy, pl. iii, fig. 4 ; COSTA, p. 14, Atti Acc. Napoli (2) iv, No. 5.

*Lophyrus rufus*, notes on as injurious ; ORMEROD, Rep. 1890, p. 118.

*Macrophya laticarpus*, Bavaria, p. 188, *flavipennis*, Trieste, p. 190, KRIECHBAUMER, Ent. Nachr. xvii ; *M. pallidilabris*, Greece, COSTA, Atti Acc. Napoli (2) iv, No. 5, p. 10 ; *M. prasinipes*, Caucasus, KONOW, p. 46, Wien. ent. Z. x ; *M. sanguinipes*, Mesopotamia, MOCSÁRY, p. 156, Term. füzetek, xiv ; *M. dalmatina*, GASPERINI (323) : n. spp.

*Monoctenus unicolor*, n. n. for *M. juniperi*, Marl. ; MARLATT, P. E. Soc. Wash. ii, p. 125.

*Nematus* (*Messa* ?), metamorphoses described and figured ; RILEY & MARLATT, Ins. Life, iv, pp. 174-176, fig. 14.

*N. hololeucopus*, p. 4, *biannulatus*, pl. iii, fig. 2, *filicornis*, p. 5, Greece, COSTA, Atti Acc. Napoli (2) iv, No. 5, n. spp.

*Parabia*, n. subg. of *Abia*, p. 174, for *A. (P.) jakolewi*, n. sp., Turkestan, p. 172 ; SEMENOW, Hor. Ent. Ross. xxv.

*Pæcilonota luteola*, Klg., n. var. *cingulata* ; KONOW, p. 43, Wien. ent. Z. x.

*Pæcilosoma parvula*, Germany, KONOW, p. 215, Deutsche e. Z. 1891, n. sp.

*Rhogogastera lichtwardi*, Germany, KONOW, p. 216, Deutsche e. Z. 1891, n. sp.

*Sciopteryx læta*, Caucasus, KONOW, p. 45, Wien. ent. Z. x, n. sp.

*Schizocera dalmatica*, Dalmatia, *konowi*, Hungary, MOCSÁRY, Term. füzetek, xiv, p. 155, n. spp.

*Strongylogaster desbrochersi*, Algeria, KONOW, p. 214, Deutsche e. Z. 1891, n. sp.

*Tarpa (Megalodontes) jucunda*, Mesopotamia, *multicincta*, Caucasus, MOCSÁRY, p. 157, Term. füzetek, xiv, n. spp.

*Taxonus ballioni*, S. Russia, KONOW, p. 44, Wien. ent. Z. x, n. sp.

*Tenthredo sobrina*, Eversm., ♂ described ; KONOW, p. 44, Wien. ent. Z. x.

*T. amurensis*, E. Siberia, KONOW, p. 48, Wien. ent. Z. x ; *T. chyeri*, Hungary, MOCSÁRY, p. 156, Term. füzetek, xiv : n. spp.

*Tenthredopsis schmiedeknechti*, Thuringia, KONOW, p. 216, Deutsche e. Z. 1891 ; *T. nigella*, Caucasus, KONOW, p. 46, Wien. ent. Z. x : n. spp.

## (C.) *LEPIDOPTERA*.

On the use of the terms aberration and variety in *Lepidoptera* by Staudinger ; RIESEN (716) and STAUDINGER (842).

Influence of temperature in pupal stage on colour and markings ; MERRIFIELD (577).

*Lepidoptera* with wingless females discussed ; KNATZ (476).

Antennæ and wings of pupæ discussed : POULTON (668).

The legs and various parts of external structure of larvæ ; PACKARD (643).

Typical venation explained ; MEYRICK (584).

List of the *Lepidoptera* reared in the Insect-house, Zoological Gardens, London, in 1890 ; THOMSON, P. Z. S. 1891, pp. 179 & 180.

## *RHOPALOCERA*.

[*Cf.* AURIVILLIUS (24), BAKER (26, 27), BUTLER (117), COCKERELL (153), CROWLEY (170), DOGNIN (192, 193, 194), DOHERTY (196, 197, 198), DRUCE (211, 212, 213, 214), EDWARDS (234, 235, 236), ELWES (239), FERGUSON (276), FITCH (280), FUCHS (308), GODMAN & SALVIN (963), GROSS (351), GROUM-GRSHIMAÏLO (355), GUNDLACH (361), HAASE (362, 363, 364), HAMPSON (370), HOLLAND (397, 398), HONRATH (401), LEECH (512, 513, 514), LUCAS (545), MABILLE (549), MABILLE & VUILLOT (554), MAYNARD (570), MISKIN (594, 595), MOORE (600), NICÉVILLE (620, 621), OBERTHUR (628, 629), OLLIFF (631), PACKARD (643), PIEPERS (657), PLAXTON (659), POUJADE (663), REUTER (707), RIPPON (728), RÖBER (738), ROGENHOFER (747, 748), SEMPER (801), SHARPE (808, 809, 810), SKINNER (814), SMITH (818, 819), SMITH & KIRBY (820), SNELLEN (828), SOUTH (834), STAUDINGER (840, 841), TRIMEN (874, 875), URECH (888), VUILLOT (907-910), WATSON (941, 942), WEEKS (946, 947), WEIR (949), WRIGHT (970).]

Catalogue of *Rhopalocera* of Australia ; MISKIN (594).

Hints on the origin of the *Rhopalocera* ; PACKARD, pp. 110-114, P. Bost. Soc. xxv.

Origin of colour in the wings of butterflies and phylogenetic discussion ; URECH (888).

*Palæotropinæ*, n. subfam. for the genus *Hamudryas* ; HAASE, Deutsche e. Z. Lep. p. 29.

HAASE (362) proposes the following arrangement of the *Rhopalocera* :—

### A. RHOPALOCERA, s. str.

- i. Fam. *Acræomorpha*, with subfamm. *Nymphalinae*, *Heliconinae*, *Acræine*.

- II. Fam. *Danaomorpha*, with subfamm. *Neotropinæ*, *Palæotropinæ*, *Danainæ*.
- III. Fam. *Satromorpha*, with subfamm. *Morphinæ*, *Brassolinæ*, *Satyrinæ*.
- IV. Fam. *Erycinidæ*, with subfamm. *Libytheinæ*, *Erycininæ*.
- V. Fam. *Lycænidæ*.
- VI. Fam. *Pieridæ*.
- VII. Fam. *Papilionidæ*.
- B. NETROCERA.
- VIII. Fam. *Hesperiidæ*.

For figs. of some of the species described of late years in Le Nat., see DOGNIN (194).

## PAPILIONIDÆ.

Pupal and imaginal neuration of *Papilionidæ* discussed; the phylogeny of the groups of *Papilio*, with remarks on the allied genera; HAASE (364).

Development of the wing-veins of *Papilio machaon*; HAASE (363).

Note on the colour of the first submarginal lunule in some *Papilionidæ*; WEIR, Ent. xxiv, p. 105, and BOWLES, p. 130, t. c.

*Ornithoptera*: figs. and descriptions of the species continued by RIPON (728). *O. trojana*, Staud., figure; WATKINS, Ent. xxiv, p. 177, pl. iv.

*O. nereis*, Engano, DOHERTY, p. 30, J. A. S. B. lx, pt. 2; *O. naias*, Sumba, *id.* p. 193, t. c.; *O. socrates*, Wetter and Sumbawa, STAUDINGER, p. 71, Deutsche e. Z. Lep.; *O. helena*, L., n. var. *leda*, *id.* p. 74, t. c.; *O. olympia*, Borneo, HONRATH, p. 241, Ent. Nachr. xvii: n. spp.

*Papilio memnon* var. *achates*, ♂ & ♀ characters; RITSEMA, p. cxv, Tijdschr. Ent. xxxiv. *P. helenus* n. var. *euganius*; DOHERTY, p. 31, J. A. S. B. lx, pt. 2. *P. turnus* var. described; LAURENT, Ent. News, ii, p. 33. *P. morania*, Angas, var. described, p. 100, figured, pl. ix, fig. 21; TRIMEN, P. Z. S. 1891. *P. xanthopleura* n. var. *diaphora*; STAUDINGER, p. 63, Deutsche e. Z. Lep. iv. *P. polices* var. *nigrescens*, note on; AURIVILLIUS, p. 225, Ent. Tidskr. xii. *P. machaon*, variation in colour of pupæ; REUTER, p. 7, Ent. Nachr. xvii. *P. machaon* n. var. *marginalis*; ROBBE, p. cccxcv, C.R. Ent. Belg. xxxv. *P. machaon* n. var. *watzkai*; GARBOWSKI, Soc. Ent. v, p. 154. *P. caunus*, ♀ described; HONRATH, B. E. Z. xxxvi, SB. p. x. *P. (Chilasa) idæoides*, pl. xliii, fig. 1, *palephates*, figs. 6 & 7, and var. *panopinus*, fig. 8, *stratocles*, figs. 2-5, *P. (Menelaides) antiphus*, pl. xlv, figs. 3-6, & pl. xlv, figs. 1 & 2, *aristolochie* n. var. *philippus*, pl. xlv, figs. 7-9, pl. xlv, figs. 3 & 4, & pl. xlv, fig. 1, *phegeus*, pl. xlv, fig. 4, *maria*, fig. 5, figured; SEMPER, Reisen Philipp. ii, v. *P. americanus*, imago figured, figs. 1-3, *zolicaon*, preparatory stages, figs. a-g, figured; EDWARDS, Butt. N. Am. 3rd ser. *Papilio*, iii. *P. woodfordi*, pl. x, *marondavana*, pl. xi, figs. 1 & 2, *erithonioides*, figs. 3 & 4, figured; SMITH & KIRBY, Rhop. ex. *Papilionidæ*, *Papilio*. *P. tamerlanus* var. = (*paphus*, Nicév.); HONRATH, B. E. Z. xxxvi, SB. p. viii. *P. dardanus*, Brown, = (*merope*, Cr.); HAMFSON, p. 182, Ann. N. H. (6) vii. *P.*

*auriger*, Butl., = (*harpagon*, Sm.), figured, pl. ii, fig. 1; AURIVILLIUS, Ent. Tidskr. xii. *P. polydamas* var. *polycrates*, larva and pupa described; COCKERELL, J. Inst. Jamaica, i, pp. 27 & 28. *P. anchisiades*, note on larva; CARACCILO, Ent. News, ii, p. 52. *P. erectheus*, metamorphosez; EDWARDS, Vict. Nat. vii, p. 20. *P. macleayanus*, habits; LYELL, t. c. p. 27.

*P. utuba*, E. Africa, HAMPSON, p. 182, Ann. N. H. (6) vii; *P. mackinnoni*, p. 187, pl. xvi, fig. 1, *jacksoni*, p. 188, pl. xvii, figs. 1 & 2, E. Africa, SHARPE, P. Z. S. 1891; *P. nobilis*, E. Africa, ROGENHOFER, Verh. z.-b. Wien, xli, p. 563; *P. morondavana*, Madagascar, SMITH, p. 78, Ann. N. H. (6) viii; *P. erithonioides*, Madagascar, SMITH, Ann. N. H. (6) vii, p. 122; *P. (Iliades) oceani*, Engano, DOHERTY, p. 31, J. A. S. B. lx, pt. 2; *P. (Iliades) merapu*, p. 191, *P. (Menelaides) oreon*, *P. (Harimala) marenba*, p. 192, Sumba, DOHERTY, t. c.; *P. (Menelaides) schadenbergi*, pl. xlv, fig. 1, & pl. xlv, fig. 5, with var. *micholitzii*, pl. xlv, fig. 2, & pl. xlv, fig. 6, p. 269, *almæ*, pl. xlv, fig. 6, & p. 270, Philippines, SEMPER, Reisen Philipp. ii, v; *P. quadratus*, Upper Amazons, p. 61, STAUDINGER, Deutsche e. Z. Lep. iv : n. spp.

*Parnassius nomion* n. var. *nomius*, p. 445, *delphius* n. var. *acdestis*, p. 446, *imperator* n. var. *musageta*; GROUM-GRSHIMAÏLO, Hor. Ent. Ross. xxv. *P. delphius* n. var. *maximinus*; STAUDINGER, p. 158, Deutsche e. Z. Lep. iv. *P. delphius* n. var. *infumata*, *mnemosyne* n. var. *ochracea*; AUSTAUT, p. 180, Le Nat. 1891: figures and remarks on the following species by OBERTHUR, Études, xiv—*imperator*, ♂, pl. i, fig. 1, *nomion* var. *mandschuriæ*, p. 2, pl. ii, fig. 10, *dauidis*, pl. i, fig. 3, with habitat, p. 2, *apollo* varr. *uralensis*, pl. iii, fig. 18, *siciliæ*, fig. 22, other varr. figs. 14, 19, 20, & 21, *delius* varr. *herrichii*, *cardinalis*, pl. ii, figs. 15 & 16, *clodius* var. *lorquini*, fig. 17, *jacquemontii* varr., pl. ii, figs. 11–13, pl. i, figs. 4–7, synonymy discussed, pp. 9–14, *simo*, pl. i, figs. 8 & 9.

*P. mercurius*, p. 445, *cephalus*, p. 446, Central Asia, GROUM-GRSHIMAÏLO, Hor. Ent. Ross. xxv; *P. orleans*, Ta-t sien-lu, OBERTHUR, Études, xiv, p. 8, pl. i, fig. 2 : n. spp.

*Thais rumina*, var. described and figured; POUJADE, p. 597, pl. 16, Ann. Soc. Ent. Fr. 1891.

#### PIERIDÆ.

*Appias panda* n. var. *nigerrima*; HOLLAND, p. 76, pl. iv, fig. 3, P. Bost. Soc. xxv. *A. zelmira*, pl. xxxviii, figs. 4–15, *andrea*, pl. xxxix, fig. 6, *nephele*, figs. 7–15, *domitia*, pl. xl, figs. 1–5, *albina*, figs. 6–8, *agave*, figs. 9–11, *maria*, pl. xxxix, figs. 1–4, *phæbe*, fig. 5, figured; SEMPER, Reisen Philipp. ii, v.

*Belenois margaritacea*, E. Africa, SHARPE, p. 191, pl. xvi, fig. 4, P. Z. S. 1891; *B. mabella*, p. 79, *mahobo*, p. 80, Madagascar, SMITH, Ann. N. H. (6) viii : n. spp.

*Callidryas eubule*, migration of; DAVIS, Ins. Life, iii, p. 335: larva and pupa described; ROWLEY, Ent. News, ii, p. 118. *C. sennæ*, L., larva and pupa described; COCKERELL, p. 28, J. Inst. Jamaica, i.



*Callosune mrogoroana*, Zanzibar, VUILLOT, pp. ci & cxv, Bull. Soc. Ent. Fr. 1891, n. sp.

*Catopsilia neleis* and *agarithe*, varr. of described; NEUMOEGEN, p. 122, Canad. Ent. xxiii. *C. (Callidryas) crocale*, migrations discussed; PIEPERS (657). *C. crocale* and *flava* are females of one species; HOLLAND, p. 75, P. Bost. Soc. xxv. *C. pyranthe*, larva and pupa figured, p. 258, pl. B, fig. 5; SEMPER, Reisen. Philipp. ii, v.

*Colias cocandica*, n. var. *maja*, p. 447, *wiskotti*, n. var. *draconis*, p. 465; GROUM-GRSHIMAILO, Hor. Ent. Ross. xxv. *C. wiskotti*, notes on its variation; AUSTAUT, Le Nat. 1891, p. 98. *C. cesonia*, notes on; ROWLEY, Ent. News, ii, p. 133. *C. phicomone*, second generation noticed; GROSS, p. 355, S. E. Z. 1891.

*C. sifanica*, *lada*, p. 447, *felderi*, p. 448, *diva*, p. 449, Central Asia, GROUM-GRSHIMAILO, Hor. Ent. Ross. xxv; *C. alticola*, Ecuador, GODMAN & SALVIN, in Whympers Supp. App. p. 107: n. spp.

*Delias rosenbergii*, n. var. *catamelus*, p. 77, *belisama*, Cr., n. varr., pp. 78-80. STAUDINGER, Deutsche e. Z. Lep. iv. *D. teutona*: metamorphoses described; EDWARDS, Vict. Nat. vii, p. 20.

*D. melusina*, Celebes, STAUDINGER, p. 76, Deutsche e. Z. Lep.; *D. oraia*, Sambawa, *aurantia*, Java, DOHERTY, p. 189, J. A. S. B. lx: n. spp.

*Eronia hippia*: genitalia of gynandromorphous example described; BAKER, Tr. E. Soc. 1891, p. 1, pl. i.

*Huphina ethel*, Engano, DOHERTY, p. 29, J. A. S. B. lx, pt. 2; *H. julia*, p. 187, pl. ii, fig. 12, *eirene*, Sumba, *vaso*, Sambawa, p. 188, *id. t. c.*: n. spp.

*Ixias pyrene*: variation described; WATSON, p. 52, J. Bomb. Soc. N. H. vi.

*Kricogonia lyside*: larva and pupa described; COCKERELL, p. 29, J. Inst. Jamaica, i.

*Leptalis schaussi*, Loja, DOGNIN, Le Nat. 1891, p. 85, n. sp.

*Leptosia aiphia*, figured, pl. xlii, figs. 1 & 2; SEMPER, Reisen Philipp. ii, v.

*Mylothris camerunica*, p. 220, *knutsoni*, p. 222, Cameroons, AURIVILLIUS, Ent. Tidskr. xii; *M. wintoniana*, p. 189, pl. xvi, fig. 2, *jacksoni*, pl. xvi, fig. 3, *mackenziana*, pl. xvi, fig. 5, p. 190, E. Africa, SHARPE, P. Z. S. 1891; *M. majungana*, Madagascar, SMITH, Ann. N. H. (6) vii, p. 124: n. spp.

*Nepheronia hippia*, var. *boebera*, pl. xlii, figs. 3-8, *phocacea*, fig. 10, figured; SEMPER, Reisen Philipp. ii, v.

*Phrissura ægis* figured, pl. xl, figs. 14 & 15, SEMPER, Reisen Philipp. ii, v.

*Pieris paroreia*, Hew., ♀ described; AURIVILLIUS, p. 222, Ent. Tidskr. xii. *P. teutonia*, Don., migratory swarm of; DUNCAN, P. Linn. Soc. N.S.W. (2) v, p. 898. *P. brassice*, n. var. *wollastoni*; BAKER, Tr. E. Soc. 1891, p. 198. *P. davidis*, ♀, p. 57, n. var. *venata*, p. 58, described; LEECH, Ent. xxiv, Supp. *P. napi*, variation in Ireland; BARRETT, Ent. M. M. (2) ii, p. 329. *P. daphidice* destroyed by *Drosera*; KLINGGRAEFF, Schr. Ges. Danz. (2) vii, 3, p. 22.

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*P. ramona*, Madagascar, SMITH, p. 123, Ann. N. H. (6) vii ; *P. halisca*, p. 7, pl. iii, fig. 23, *dauidina*, p. 8, fig. 20, Ta-tsien-lu ; OBERTHUR, Études d'Ent. xv ; *P. eurydice*, China, LEECH, Ent. xxiv, Supp. p. 5 : n spp.

*Ptychopteryx*? *ducissa*, Zanzibar, DOGNIN, Le Nat. 1891, p. 132, n. sp.

*Rhodocera cleopatra*, var. *maderensis*, noticed, p. 199, figured, pl. xii, figs. 1 & 1a ; BAKER, Tr. E. Soc. 1891.

*Saletara nathalia*, figured ; SEMPER, Reisen Philipp. ii, v, pl. xl, fig. 12 & 13.

*S. schonbergi*, Borneo, SEMPER, Reisen Philipp. ii, v, p. 249, n. sp.

*Teracolus bifasciatus*, Shpe., ♂ described ; HAMPSON, p. 181, Ann. N. H. (6) vii.

*T. emini*, Central Africa, BUTLER, p. 47, Ann. N. H. (6) vii ; *T. elgonensis*, E. Africa, SHARPE, p. 191, pl. xvi, fig. 6, P. Z. S. 1891 : n. spp.

*Terias rahel* and *tondana*, specific distinctions ; HOLLAND, p. 76, P. Bost. Soc. xxv. *T. venata*, pl. xli, figs. 1 & 2, *vallivolans*, figs. 3-6, *sari*, n. var. *sarilata*, figs. 10-12, *hecabe*, figs. 13-17, *invida*, figs. 18-20, *alitha*, figs. 21-24, figured ; SEMPER, Reisen Philipp. ii, v.

*T. simulatrix* (Stdg.), Philippines, SEMPER, Reisen Philipp. ii, v, p. 253, pl. xli, figs. 7-9, n. sp.

## DANAIDÆ.

Notes on the nomenclature of the genera and on classification ; DOHERTY, J. A. S. B. lx, pt. 2, pp. 8-19.

MOORE continues his descriptions and figures of the E. Indian species of *Euplœinæ* ; Lep. Ind. pp. 113-140, pls. xli-liii.

*Amauris jacksoni*, E. Africa, SHARPE, p. 633, pl. xlviii, fig. 2, P. Z. S. 1891 ; *A. difficilis*, Gaboon, p. 194, *dannfelti*, Congo, p. 196, AURIVILLIUS, Ent. Tidskr. xii : n. spp.

*Danaïs chrysippus*, var. described and figured ; SNELLEN, Tijdschr. Ent. xxxiv, p. 37, pl. i. *D. chrysippus*, varr. habitat noticed ; DISTANT, p. xxiii, P. E. Soc. 1891. *D. plexippus*, periodicity in New Zealand ; KINGSLEY, Tr. N. Z. Inst. xxiii, p. 192.

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*Euplœa* : notes on the species migratory in Java ; PIEPERS (657). *E. klugii*, variation described ; WATSON, pp. 29-32, J. Bomb. N. H. Soc. vi. *E. viola*, variation noticed ; HOLLAND, p. 54, P. Bost. Soc. xxv. *E. corinna*, pupa described ; EDWARDS, Vict. Nat. vii, p. 22. *E. hansemanni*, Honr., = (*dursteini*, Stgr.) ; HONRATH, B. E. Z. xxxvi, p. xvi, SB. *E. dursteini* : the ♂ specimens on which this was based are *hansemanni*, Honr., the ♀ being truly distinct ; STAUDINGER, p. 81, Deutsche e. Z. Lep. iv.

*E. (Trepsichrois) malakoni*, *E. (Crastia) enganensis*, p. 20, *E. (C.?) oceanis*, p. 21, *E. pahakela*, p. 22, Engano, DOHERTY, J. A. S. B. lx, pt. 2 ; *E. (Trepsichrois) dongo*, Sambawa, p. 160, *elwesi*, Sumba, p. 161, pl. ii, fig. 1, *E. (Rasuma?) lewa*, fig. 2, *E. (Crastia or Vadebra)*, fig. 3, p. 162, *E. (Crastia?) deheerii*, p. 163, Sumba, DOHERTY, t. c. ; *E. spartacus, suada*, New Guinea, MISKIN (595) p. 119 : n. spp.

*Isamia carpenteri*, Mergui Arch., MOORE, p. 131, pl. 1, figs. 1 & 1a, Lep. Ind., n. sp.

*Ithomia consobrina*, Ecuador, GODMAN & SALVIN, in Whympers Supp. App. p. 97, n. sp.

*Macrophecia corus*, n. var. *micronesia* ; DOHERTY, p. 19, J. A. S. B. lx, pt. 2.

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*Pademna sherwillii*, Assam, MOORE, p. 120, pl. xlv, fig. 1, Lep. Ind., n. sp.

*Radena longa*, pl. i, fig. 2, *macra*, fig. 4, Engano, DOHERTY, p. 24, J. A. S. B. lx, pt. 2 ; *R. oberthurii*, pl. ii, fig. 6, *kambura*, fig. 7, p. 167, Sumba, DOHERTY, t. c. : n. spp.

*Salpinx phane*, Engano, DOHERTY, p. 20, J. A. S. B. lx, pt. 2 ; *S. meizon*, *S. (Calliphecia) sumbana*, p. 159, Sumba, *sambavana*, Sambawa, p. 160, DOHERTY, t. c. : n. spp.

*Stictophecia crowleyi*, Tenasserim, MOORE, p. 138, pl. lii, fig. 2, Lep. Ind. ; *S. melolo*, Sumba ; DOHERTY, p. 160, J. A. S. B. lx : n. spp.

#### ACRÆIDÆ.

*Acræa satis*, Ward., = (*corona*, Str.), *rogersi*, Hew., = (*ehmckeii*, Dew.), *insignis*, Dist., = (*balbina*, Obert.), *zonata*, Hew., = (*makupa*, Sm.), *A. abdera*, Hew., ♀ described ; AURIVILLIUS, p. 200, Ent. Tidskr. xii. *A. atolmis*, Westw., figured, pl. viii, figs. 1-4, coloration and variation described, pp. 63 & 64, *axina*, Westw., specific validity of, p. 66, *asema*, Hew., figured, figs. 9 & 10, redescribed, p. 68, *rahira*, note on, p. 73 ; TRIMEN, P. Z. S. 1891.

*A. telchinia, rosina*, E. Africa, ROGENHOFER, p. 565, Verh. z.-b. Wien, xli ; *A. excelsior*, p. 192, pl. xvii, fig. 3, *melanoxantha*, fig. 4, *oreas*, fig. 5, p. 193, E. Africa, SHARPE, P. Z. S. 1891 ; *A. usagaræ*, E. Africa, VUILLOT, p. lxxviii, Bull. Soc. Ent. Fr. 1891 ; *A. bertha*, Zanzibar, *id.* p. xcvi, t. c. ; *A. mhondana*, Zanzibar, *id.* p. cxv, t. c. ; *A. sotikensis*, E. Africa, SHARPE, p. 634, pl. xlviii, fig. 1 ; *A. (Telchinia) tenella*, W. Africa, ROGENHOFER, p. 457, pl. xv, fig. 1, Ann. Hofmuseum Wien, vi ; *A. felina*, p. 65, pl. viii, figs. 5 & 6, *onerata*, p. 67, figs. 7 & 8, *ambigua*, p. 70, pl. ix, fig. 11, S. W. Africa, TRIMEN, P. Z. S. 1891 ; *A. andromba*, Madagascar, SMITH, p. 124, Ann. N. H. (6) vii ; *A. dohertyi*, Celebes, HOLLAND, p. 61, pl. v, fig. 7, P. Bost. Soc. xxv : n. spp.

*Planema latifasciata*, E. Africa, SHARPE, p. 635, pl. xlviii, fig. 6, P. Z. S. 1891 ; *P. meruana, quadricolor*, pl. xv, fig. 3, p. 458, *telekiana*, fig. 4, *fullax*, fig. 6, p. 459, Trop. Africa, ROGENHOFER, Ann. Hofmuseum Wien, vi : n. spp.

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*Abrotu pratti*, W. China, LEECH, Ent. xxiv, Supp. p. 28, n. sp.

*Anœa andria*, Scud., is not the same as *troglogyta*, auct. ; NEUMOEGEN, Ent. News, ii, p. 175.

*Apatura cleochares*, Hew., figured, and referred to *Thaleropsis* ; SMITH & KIRBY, Rhop. ex. *Nymphalinae*, *Thaleropsis*, i, figs. 1 & 2. *A. flora*, metamorphoses figured ; EDWARDS, Butt. N. Am. 3rd ser., *Apatura*, i.

*A. ilia*, n. var. *serarum*, OBERTHUR, p. 11, pl. i, fig. 8, Études d'Ent. xv. *A. chrysus*, Léou-fang, id. p. 10, pl. i, fig. 6, t. c. ; *A. subcærulea*, p. 29 *fulva*, p. 30, W. China ; LEECH, Ent. xxiv, Supp. : n. spp.

*Araschnia proroides* (Blanch.), Naga Hills, ELWES, p. 285, pl. xxvii, figs. 5 & 6, P. Z. S. 1891, n. sp.

*Argynnis* : variation of venation in relation to the validity of *Brenthis* ; NICÉVILLE, p. 348, J. Bomb. N. H. Soc. vi. *A. pales*, n. var. *sifunica* ; *eugenia*, n. var. *rhea*, p. 456 ; *adippe*, n. var. *xipe*, p. 457 ; GROUM-GRSHIMAÏLO, Hor. Ent. Ross. xxv. *A. aglaia*, var. figured ; CLARK, Ent. Rec. ii, p. 265.

*A. eva*, Central Asia, GROUM-GRSHIMAÏLO, p. 456, Hor. Ent. Ross. xxv ; *A. mackinnonii*, Himalaya, NICÉVILLE, p. 346, pl. f, figs. 4 & 5, J. Bomb. N. H. Soc. vi ; *A. churis*, Yunnan, p. 8, pl. i, fig. 4, *castetsi*, Trichinopoly, p. 9, fig. 1, OBERTHUR, Études d'Ent. xv ; *A. victoria*, Alberta territory, EDWARDS, p. 198, Canad. Ent. xxiii : n. spp.

*Aterica grose-smithi*, Cameroons, p. 94, *feronia*, p. 96, *simplex*, p. 97, Sierra Leone, STAUDINGER, Deutsche e. Z. Lep. iv, n. spp.

*Athyma karita*, Sumba, DOHERTY, p. 175, J. A. S. B. lx, n. sp.

*Catagramma excelsior*, Stgr., n. varr. *michaeli*, &c., Upper Amazons, STAUDINGER, Deutsche e. Z. Lep. p. 65.

*C. cyclops*, Tapajos, STAUDINGER, Deutsche e. Z. Lep. iv, p. 68, n. sp.

*Catuna crithea*, Dr., and *angustatum*, Feld., characters and synonymy ; AURIVILLIUS, p. 208, Ent. Tidskr. xii.

*Cethonia picta*, dimorphism of ♀ ; HOLLAND, p. 62, P. Bost. Soc. xxv.

*C. tambora*, Sambawa, DOHERTY, p. 171, J. A. S. B. lx, n. sp.

*Charaxes narceus* n. var. *thibetanus*, p. 11, pl. ii, fig. 10, *satyrina* n. var. *menedemus*, p. 13, pl. ii, fig. 9 ; OBERTHUR, Études d'Ent. xv. *C. ameliæ*, Doum., = (*regius*, Aur.), figured, pl. iii, fig. 1 ; AURIVILLIUS, p. 215, Ent. Tidskr. xii. *C. attila*, figs. 1 & 2, *galaxia*, figs. 3 & 4, figured ; SMITH & KIRBY, Rhop. ex. *Nymphalidæ*, *Charaxes*, pl. v.

*C. homerus*, p. 132, pl. ii, fig. 1, *midas*, p. 135, pl. ii, fig. 4, *nausicaa*, p. 137, W. Africa, STAUDINGER, Deutsche e. Z. Lep. iv ; *C. baumanni*, E. Africa, ROGENHOFER, p. 564, Verh. z. b. Wien, xli ; *C. clitiophon*, Tsé-Kou, OBERTHUR, p. 12, pl. ii, fig. 11, Études d'Ent. xv ; *C. ganymedes*, *posidonius*, W. China, LEECH, Ent. xxiv, Supp. p. 30 : n. spp.

*Crenis natalensis*, var. ?, noticed, p. 76, figured, pl. ix, fig. 12 ; TRIMEN, P. Z. S. 1891. *C. occidentulum*, Mab., = (*vadimonis*, Dr.) ; AURIVILLIUS, p. 205, Ent. Tidskr. xii.

*Cymothoë lisidora*, Cameroons, AURIVILLIUS, p. 214, Ent. Tidskr. xii, n. sp.

*Cyrestis irma*, Forbes, redescribed ; NICÉVILLE, p. 358, J. Bomb. N. H. Soc. vi.

*Ergolis celebensis*, p. 64. pl. iii, figs. 3 & 4, *merionoides*, p. 66, figs. 1 & 2, Celebes, HOLLAND, P. Bost. Soc. xxv, n. spp.

*Euphadra preussi*, p. 119, pl. i, fig. 1, with varr. *njami* and *njamnjami*, p. 125, *auriger*, p. 126, *aberrans*, p. 128, pl. ii, fig. 2, *elephantina*, p. 130, pl. ii, fig. 3, W. Africa, STAUDINGER, Deutsche e. Z. Lep. iv, n. spp.

↓ *Euptera*, n. g., near *Euryphene*, for *E. sirene*, Gold Coast, pl. i, fig. 6, p. 98, *hirundo*, Gaboon, p. 101, n. spp., including also *Euryphene elabontas*, Hew. ; STAUDINGER, Deutsche e. Z. Lep. iv.

*Euripus funebris*, W. China, LEECH, Ent. xxiv, Supp. p. 27, n. sp.

↓ *Euryphadra*, n. g., near *Euryphene*, for *E. thauma*, n. sp., Gaboon ; STAUDINGER, p. 102, Deutsche e. Z. Lep. iv.

*Euryphene kinugnana*, figured and referred to *Thaleropsis* ; SMITH & KIRBY, Rhop. ex. *Nymphalidæ*, *Thaleropsis*, i, figs. 5-7, p. 3.

*E. flaminia*, p. 110, pl. i, fig. 4, *maximiana*, p. 112, *phantasiella*, with var. ? *phantasina*, p. 114, *leonina*, p. 116, W. Africa, STAUDINGER, Deutsche e. Z. Lep. iv, n. spp.

↓ *Euryphura*, n. subg. of *Euryphadra*, for *Euryphene porphyron*, Ward, *doralice*, Hew., *plantilla*, Hew., p. 103, and *E. nobilis*, n. sp., Sierra Leone, p. 107, pl. i, fig. 3, STAUDINGER, Deutsche e. Z. Lep. iv.

*Euthalia appiades* and allies, variation and synonymy discussed ; NICÉVILLE, pp. 350-352, J. Bomb. N. H. Soc. vi. *E. omei*, Leech, noted as probable var. of *anyte* ; ELWES, p. 279, P. Z. S. 1891. *E. kardama*, Moore, figured ; SMITH & KIRBY, Rhop. ex. *Nymphalidæ*, *Euthalia*, ii, figs. 1-3. *E. confucius*, figured ; *id. t. c.* pl. iii, figs. 1 & 2.

*E. narayana*, Burma, SMITH & KIRBY, Rhop. ex. *Nymphalidæ*, *Euthalia*, ii, p. 6, figs. 4 & 5 ; *E. eriphylæ*, Tenasserim, NICÉVILLE, p. 353, pl. f, fig. 7, J. Bomb. N. H. Soc. vi ; *E. pratti*, *staudingeri*, *hebe*, China, LEECH, Ent. xxiv, Supp. p. 4 ; *E. consobrina*, *omeia*, W. China, *id. t. c.* p. 29, figured, SMITH & KIRBY, Rhop. ex. *Nymphalidæ*, *Euthalia*, pl. iii : n. spp.

*Harma concordia*, Hopf., noticed and referred to *Crenis* ; TRIMEN, p. 77, P. Z. S. 1891.

*Herona schoenbergi*, Borneo, STAUDINGER, p. 84, Deutsche e. Z. Lep. iv, n. sp.

*Hestina nigrivena*, figs. 1 & 2, *oberthuri*, Leech, figs. 5 & 6, figured ; SMITH & KIRBY, Rhop. ex. *Nymphalidæ*, *Hestina*, i.

*Hestina yankowskyi*, China, SMITH & KIRBY, Rhop. ex. *Nymphalidæ*, *Hestina*, i, figs. 3 & 4, p. 2 ; *H. subviridis*, W. China, LEECH, Ent. xxiv, Supp. p. 27 : n. spp.

*Heterochroa californica*, larva described ; DYAR, p. 278, Canad. Ent. xxiii.

*Hypolymnas poggei*, Dew., noticed and referred to *Pseudacraea* ; TRIMEN, p. 79, P. Z. S. 1891. *H. bartteloti*, figs. 1 & 2, *stanleyi*, figs. 3 & 4, figured ; SMITH & KIRBY, Rhop. ex. *Nymphalidæ*, *Hypolymnas*, i.

*H. deludens*, Madagascar, SMITH, Ann. N. H. (6) vii, p. 125, n. sp.

*Junonia asterie*, L., n. var. *sumbæ* ; DOHERTY, p. 172, J. A. S. B. lx. *J. cania*, larva described ; DYAR, p. 187, Canad. Ent. xxiii.

*Limenitis sibylla*, local var. noticed ; STRECKFUSS, B. E. Z. xxxvi, SB., p. viii : notes on early stages ; FOWLER, Ent. xxiv, p. 283. *L. proserpina*, specific validity discussed ; EDWARDS, Canad. Ent. xxiii, p. 49, and SMITH, t. c. pp. 104 & 105. *L. lorquini*, larva described ; DYAR, pp. 172 & 201, Canad. Ent. xxiii.

*L. agneya*, Perak, p. 176, *hollandii*, Sambawa, p. 177, DOHERTY, J. A. S. B. lx ; *L. livida*, p. 27, *albomaculata*, p. 28, W. China, LEECH, Ent. xxiv, Supp. : n. spp.

*Melanocyma faunula*, Westw., male characters noticed ; ELWES, p. 272, P. Z. S. 1891.

*Melitæa didyma*, n. var. *latonia*, *saxatilis*, n. var. *infernalis* ; GROOM-GRSHIMAÏLO, p. 455, Hor. Ent. Ross. xxv. *M. athalia*, var. noticed ; ZIEGLER, B. E. Z. xxxvi, p. xiv, SB. *M. athalia*, n. var. *berisalii* ; RÜHL, Soc. Ent. v, p. 149. *M. phaeton*, food-plant ; BETHUNE, p. 200, Canad. Ent. xxiii.

*M. romanovi*, Central Asia, GROOM-GRSHIMAÏLO, p. 454, Hor. Ent. Ross. xxv, n. sp.

*Neptis* : notes on E. Indian species ; ELWES, pp. 274-276, P. Z. S. 1891. *N. soma*, n. var. *meridiei*, p. 26, *ombulata*, n. var. *engano*, p. 27 ; DOHERTY, J. A. S. B. lx, pt. 2. *N. nandina*, n. var. *sumba* ; *id.* p. 175, t. c.

*N. nar*, Andaman Is., NICÉVILLE, p. 349, pl. f, fig. 6, J. Bomb. N. H. Soc. vi ; *N. giddeneme*, Tsé-Kou, p. 9, pl. i, fig. 7, *asterastilis*, Upper Burma, p. 10, fig. 5, OBERTHUR, Études d'Ent. xv : n. spp.

*Neurosigma doubledayi* var. ? figured, pl. xxvii, fig. 7, noticed, p. 277 ; ELWES, P. Z. S. 1891.

*Palla varanes*, n. var. *fulvescens* ; AURIVILLIUS, p. 216, Ent. Tidskr. xii.

*Paphia troglodita*, habits ; ROWLEY, Ent. News, ii, p. 43.

*Perisama ouma*, Loja, DOGNIN, p. 85, Le Nat. 1891, n. sp.

*Phyciodes mylitta*, larva described ; DYAR, p. 203, Canad. Ent. xxiii.

*Precis petersii*, Dew., noticed as a var. of *cuama* ; TRIMEN, p. 75, P. Z. S. 1891. *P. sinuata*, n. var. *pelargoides* ; AURIVILLIUS, p. 204, Ent. Tidskr. xii.

*P. taveta*, Trop. Africa, ROGENHOFER, p. 460, pl. xv, fig. 7, Ann. Hof-museum Wien, vi ; *P. guruana*, E. Africa, ROGENHOFER, p. 564, Verh. z.-b. Wien, xli ; *P. tristis*, New Guinea, MISKIN (595) p. 121 : n. spp.

*Prothoë belisama*, Burma, CROWLEY, p. 403, pl. xviii, Tr. E. Soc. 1891 ; *P. chrysodonia*, Philippines, STAUDINGER, p. 86, Deutsche e. Z. Lep. : n. spp.

*Pseudacræa dolomena* n. var. *usagara* ; STAUDINGER, p. 88, Deutsche e. Z. Lep.

*P. theorini*, Cameroons, AURIVILLIUS, p. 207, Ent. Tidskr. xii, n. sp.

✓ *Pseudathyma*, n. g., near *Pseudacræa*, for *P. sibyllina*, n. sp., Sierra Leone ; STAUDINGER, p. 90, Deutsche e. Z. Lep. iv.

*Pseudergolis avesta*, ♀ described ; HOLLAND, p. 63, P. Bost. Soc. xxv.

*Pyrameis dejeanii*, notes on ; WEIR, Ent. xxiv, p. 225.

*Rhinopalpa megalonice*, ♀ described ; HOLLAND, P. Bost. Soc. xxv, p. 63.

*Romaleosoma rubronotata*, p. 130, *herberti*, p. 131, *sarita*, p. 133, Congo, SHARPE, Ann. N. H. (6) vii, n. spp.

*Symbrenthia hippodusa*, synonymy and variation discussed, p. 354, with fig., pl. f, fig. 10, *hypselis*, description and figure, p. 356, fig. 8; NICÉVILLE, J. Bomb. N. H. Soc. vi.

*S. sinis*, E. India, NICÉVILLE, p. 357, pl. f, fig. 9, J. Bomb. N. H. Soc. vi, n. sp.

*Symphadrea ægle*, Sumba, DOHERTY, p. 177, J. A. S. B. lx, n. sp.

*Thaleropsis kilusa*, Madagascar, SMITH, p. 125, Ann. N. H. (6) vii, figured, SMITH & KIRBY, Rhop. ex. *Nymphalinae*, *Thaleropsis*, i, figs. 3 & 4, n. sp.

*Vanessa cardui*, distribution discussed; OBERTHUR, p. lxix, Bull. Soc. Ent. Fr. 1891: var. from Sumatra noticed; HONRATH, B. E. Z. xxxvi, p. xiv, SB. *V. callirhoë*, note on; BAKER, p. 200, Tr. E. Soc. 1891. *V. io* var. *ioides*, notes on; JUNG, pp. 44-48, Verh. Ver. Hamb. vii. *V. californica*, notes on; WRIGHT, Canad. Ent. xxiii, p. 27.

*V. fenestra*, W. China, LEECH, Ent. xxiv, Supp. p. 26, n. sp.

*Yoma sabina*, variation described; HOLLAND, p. 64, P. Bost. Soc. xxv.

#### MORPHIDÆ.

*Amathusia amythaon* n. var. *insularis*; DOHERTY, p. 25, J. A. S. B. lx, pt. 2.

*Clerome kirata*, Perak, Borneo, NICÉVILLE, p. 344, pl. f, fig. 3, J. Bomb. N. H. Soc. vi, n. sp.

*Discophora* and allies, habits noticed; DOHERTY, p. 60, P. Bost. Soc. xxv.

*D. celebensis*, Celebes, HOLLAND, p. 59, pl. v, figs. 5 & 6 P. Bost. Soc. xxv, n. sp.

*Enispe lunatus*, W. China, LEECH, Ent. xxiv, Supp. p. 26, n. sp.

*Stichophthalma howqua* var. = (*louisa*, W.-M.); HONRATH, B. E. Z. xxxvi, p. xii, SB.

#### SATYRIDÆ.

MOORE commences his descriptions and figures of the E. Indian species; Lep. Ind. pp. 141-176, pls. liv-lxiv.

*Acrophthalmia thalia*, W. China, LEECH, Ent. xxiv, Supp. p. 25, n. sp.

*Arge yunnana*, Yunnan, OBERTHUR, p. 13, pl. iii, fig. 21, Études d'Ent. xv, n. sp.

*Bletogona mycalesis*, sexes distinguished; HOLLAND, p. 56, P. Bost. Soc. xxv.

*Callerebia phyllis*, W. China, LEECH, Ent. xxiv, Supp. p. 57; *C. delavayi*, Yunnan, p. 13, pl. ii, fig. 18, *yphtimoides*, Tsé-Kou, p. 14, pl. ii, fig. 16, OBERTHUR, Études d'Ent. xv: n. spp.

*Chionobas chryxus*, metamorphoses figured and described, EDWARDS, Butt. N. Am. 3rd ser. *Chionobas*, i; *uhleri*, metamorphoses and var., *id. t. c.* *Chionobas*, iii; *varunu*, imagines, *id. t. c.* *Chionobas*, iv.

*C. brucei*, Colorado, EDWARDS, Canad. Ent. xxiii, p. 33, n. sp.

*Dadulma palacio*, Loja, DOGNIN, Le Nat. 1891, p. 125, n. sp.

*Epinephele janira* and *hyperanthus*, varieties of; FROHAWK, p. xx, P. E. Soc. 1891. *E. hyperanthus*, L., forma *minor*, Fuchs., variation defined; FUCHS, pp. 215-218, JB. nass. Ver. xlv.

*E. sifunica*, Central Asia, GROUM-GRSHIMAÏLO, p. 459, Hor. Ent. Ross. xxv; *E. phania*, Yunnan, OBERTHUR, p. 17, pl. ii, fig. 17, Études d'Ent. xv : n. spp.

*Erebia pronoë*, metamorphoses, pp. 352 & 353, *psodea* v. *spodia*, habits, &c., p. 354; GROSS, S. E. Z. 1891. *E. glacialis*, habitat; RIESEN, p. 12, S. E. Z. 1891, and WACKERZAPP, t. c. p. 257.

*E. alcmena*, *herse*, Central Asia, GROUM-GRSHIMAÏLO, p. 457, Hor. Ent. Ross. xxv; *E. ethela*, Yellowstone Park, EDWARDS, p. 31, Canad. Ent. xxiii : n. spp.

*Lethe procris*, p. 2, *baucis*, *helena*, *hecate*, *camilla*, p. 3, China, LEECH, Ent. xxiv, Supp.; *L. simulans*, *calisto*, p. 23, *gemina*, p. 24, W. China, *id. t. c.*; *L. luodamia*, *titania*, *christophi*, W. China, *id. t. c.* p. 67 : n. spp.

*Melanargia titea*, Kl., n. var. *titania*; CALBULA, Deutsche e. Z. Lep. iv, p. 41.

*M. ledu*, How-Kow, LEECH, Ent. xxiv, Supp. p. 57, n. sp.

*Melanitis hylecoetes*, Celebes, HOLLAND, p. 55, pl. iv, figs. 1 & 2, P. Bost. Soc. xxv, n. sp.

*Monotrichtis*, n. subg. of *Mycalesis*, for *M. sufiza*, Hew., and *evenus*, Hpf.; HAMPSON, Ann. N. H. (6) vii, p. 179.

*Mycalesis danckelmanni*, Rog., figured, pl. xv, fig. 9, Ann. Hofmuseum Wien, vi. (This species appears to have been described in a book of travel, and may not have been recorded in Zool. Rec.; cf. t. c. p. 462.)

*M. ? kenia*, Africa, ROGENHOFER, p. 462, pl. xv, fig. 8, Ann. Hofmuseum Wien, vi; *M. dohertyi*, Perak, ELWES, p. 261, pl. xxvii, figs. 3 & 4, P. Z. S. 1891; *M. (Jutana) wayewa*, Sumba, DOHERTY, p. 168, J. A. S. B. lx : n. spp.

*Myrtilus*, n. subg. of *Mycalesis*, p. 341, for *M. (M.) mystes*, n. sp., Upper Burma, p. 343, pl. F, figs. 1 & 2; NICÉVILLE, J. Bomb. N. H. Soc. vi.

*Neocanyra*, Butl., merged in *Pseudonympha*; TRIMEN, p. 62, P. Z. S. 1891.

*Neope armandii* n. var. *fusca*; LEECH, Ent. xxiv, Supp. p. 68. *N. oberthuri*, W. China, *id. t. c.* p. 24; *N. simulans*, W. China, *id. t. c.* p. 66 : n. spp.

*Neorina patria*, W. China, LEECH, Ent. xxiv, Supp. p. 25, n. sp.

*Cneis semidea*, experiments with; SCUDDER, Psyche, vi, p. 129.

*Ce. vacuna*, *buddha*, Central Asia, GROUM-GRSHIMAÏLO, p. 458, Hor. Ent. Ross. xxv : n. spp.

*Oxeoschistus loxo*, Colombia, DOGNIN, Le Nat. 1891, p. 132, n. sp.

*Pararge ziphia*, characters discussed; BAKER, p. 202, Tr. E. Soc. 1891. *P. egeria*, notes on early stages; FOWLER, Ent. xxv, p. 285.

*Pseudonympha patula*, S. Africa, TRIMEN, p. 169, Tr. E. Soc. 1891, n. sp.



- Ragadia latifasciata*, W. China, LEECH, Ent. xxiv, Supp. p. 25, n. sp.  
 ✓ *Samundra*, n. g., for *Mycalesis anaxioides*; MOORE, p. 162, Lep. Ind. i.  
*Satyrus meadii*, metamorphoses figured and described; EDWARDS, Butt. N. Am. 3rd ser., *Satyrus*, ii. *S. semele* var. *maderensis*, described, p. 202 figured, pl. xii, figs. 2 & 2a; BAKER, Tr. E. Soc. 1891. *S. sybillina* n. var. *bianor*, GROUM-GRSHIMAÏLO, p. 458, Hor. Ent. Ross. xxv : n. spp.  
*Ypthima methora* and allies, characters discussed; ELWES, p. 267, pl. xxvii, fig. 1, P. Z. S. 1891.  
*Y. ciris*, China, LEECH, Ent. xxiv, Supp. p. 4; *Y. iris*, W. China, *id.* t. c. p. 57; *Y. insolita*, *præmubila*, *conjuncta*, W. China, *id.* t. c. p. 66; *Y. methorina*, pl. ii, fig. 15, *dromonoides*, fig. 14, Ta-Tsien-Lou, *dromon*, fig. 12, Tsé-Kou, p. 15, fig. 14, *clinia*, Ta-Tsien-Lou, fig. 13, *clinioides*, Yunnan, p. 16, OBERTHUR, Études d'Ent. xv; *Y. leuce*, Sumba, DOHERTY, p. 169, J. A. S. B. lx : n. spp.  
*Zophoessa argentata*, *helle*, p. 1, *procne*, *libitina*, p. 2, China, LEECH, Ent. xxiv, Supp., n. spp.

## ERYCINIDÆ and ELYMNIIDÆ.

*Erycinidæ*: the classification and genera considered; RÜBER, Exot. Schmett. Theil ii, pp. 227-258.

*Nemeobiinæ*: systematic position discussed; NICÉVILLE, p. 140, P. A. S. B. 1890.

*Abisara talantus*, Cameroons, AURIVILLIUS, p. 217, Ent. Tidskr. xii, n. sp.  
 ✓ *Acystipoda*, n. g., for *Pandemos nymphidioides*, Bates; RÜBER, p. 256, Exot. Schmett. Theil ii.

✓ *Amphiselenis*, n. g., for *A. chama*, Stgr.; RÜBER, p. 248, Exot. Schmett. Theil ii.

✓ *Astræodes*, n. g., for *Pandemos ureuta*, Doubl.; RÜBER, p. 256, Exot. Schmett. Theil ii.

*Bæotis dryades*, Loja, DOGNIN, Le Nat. 1891, p. 125, n. sp.

*Dodona durga*, Kol., pupa and larva described; NICÉVILLE, p. 140, P. A. S. B. 1890. *D. deodatu*, figured, pl. xxvii, fig. 8, noticed, p. 288; ELWES, P. Z. S. 1891.

*Elymnias hewitsoni*, ♀ described, p. 58, pl. v, fig. 4, P. Bost. Soc. xxv.

*Eurybia turna*, Loja, DOGNIN, Le Nat. 1891, p. 125, n. sp.

*Hopfferia*, Stgr., characters of; RÜBER, p. 252, Exot. Schmett. Theil ii.

*Lemonias maxima*, Lower California; WEEKS, Ent. News, ii, p. 104, n. sp.

*Libythea ancoata*, Madagascar, SMITH, p. 126, Ann. N. H. (6) vii; *L. tsianlava*, Madagascar, SMITH, p. 81, Ann. N. H. (6) viii; *L. nicevillei*, N. Australia, OLLIFF, p. 28, P. Linn. Soc. N.S.W. (2) vi : n. spp.

*Lymnas vidali*, Loja, DOGNIN, Le Nat. 1891, p. 125, n. sp.

✓ *Melanope*, n. g., for *Theope bahiana*, Feld.; RÜBER, p. 257, Exot. Schmett. Theil ii.

*Zemeros flegyas*, pupa described; NICÉVILLE, p. 138, P. A. S. B. 1890.

## LYCÆNIDÆ.

*Lycænidae*: the classification and genera discussed; RÖBER, Exot. Schmett. Theil ii, pp. 259-282.

*Acesina arisba*, Burma, NICÉVILLE, p. 369, pl. f, fig. 19, J. Bomb. N. H. Soc. vi.; *A. zephyretta*, *ariel*, p. 33, Upper Assam, *ammonides*, Tenasserim, p. 34, DOHERTY, J. A. S. B. lx, pt. 2 : n. spp.

*Allotinus zymna*, figs. 1 & 2, *similis*, figs. 3 & 4, figured; SMITH & KIRBY, Rhop. Ex. *Lycænidae* (African), pl. xii.

*Amblypodia obscura*, New Guinea, MISKIN (595), p. 122, n. sp.

*Aphnæus homeyeri*, Dew., note on; TRIMEN, p. 88, P. Z. S. 1891.

*A. erikssoni*, p. 86, pl. ix, fig. 15, *modestus*, p. 87, fig. 16, S. W. Africa, TRIMEN, P. Z. S. 1891, n. spp.

*Argiolaus*, n. g., for a part of *Iolaus*, type *I. silas*, Westw., p. 143, with *I. lekanion*, Sierra Leone, pp. 144, *jamesoni*, Cent. Africa, p. 145, n. spp., DRUCE, Ann. N. H. (6) viii.

*Arhopala sophrosyne*, figured, pl. xxxii, fig. 9; DRUCE, P. Z. S. 1891.

*A. khamti*, Upper Assam, DOHERTY, p. 32, pl. i, fig. 5, J. A. S. B. lx, pt. 2; *A. amatræ*, p. 370, pl. g, figs. 23 & 24, *alemon*, p. 371, pl. f, figs. 20 & 21, Burma, *basiviridis*, Malay Peninsula, pl. g, fig. 22, p. 373, NICÉVILLE, J. Bomb. N. H. Soc. vi.; *A. wildei*, Queensland, MISKIN, p. 71, Ann. Queensland Mus. i; *A. eurisus*, Solomon Is., DRUCE, p. 370, pl. xxxii, figs. 11 & 12, P. Z. S. 1891 : n. spp.

*Castalius margaritaceus*, E. Africa, SHARPE, p. 636, pl. xlviii, fig. 3, P. Z. S. 1891, n. sp.

*Catochrysops strabo* n. var. *lithargyria*; DOHERTY, p. 27, J. A. S. B. lx, pt. 2.

*Ohrysophanus arota*, larva described; DYAR, p. 204, Canad. Ent. xxiii.

*C. ouang*, Tsé-kou, OBERTHUR, p. 17, pl. ii, fig. 19, Études d'Ent. xv, n. sp.

*Cigaritis delagoensis*, Delagoa Bay, SHARPE, p. 240, Ann. N. H. (6) viii, n. sp.

*Curetis malayica* n. var. *kiritana*; DOHERTY, p. 179, J. A. S. B. lx.

*Cyaniris coalita*, Java, NICÉVILLE, p. 363, pl. f, figs. 12 & 13, J. Bomb. N. H. Soc. vi, n. sp.

*Danis serapis*, p. 49, *celestis*, p. 50, Australia, MISKIN, Ann. Queensland Mus. i, n. spp.

*Deudorix obscurata*, S.W. Africa, TRIMEN, p. 84, pl. ix, fig. 13, P. Z. S. 1891; *D. derona*, Madagascar, SMITH, Ann. N. H. (6) vii, p. 126; *D. woodfordi*, pl. xxxii, figs. 13 & 14, *viridens*, fig. 15, p. 371, Solomon Is., DRUCE, P. Z. S. 1891 : n. spp.

*Drina manea*, Hew., characters of; DOHERTY, p. 34, J. A. S. B. lx, pt. 2.

*Epamera*, n. g. for a part of *Iolaus*; DRUCE, p. 141, Ann. N. H. (6) viii.

*Epimastidia*, n. g., near *Thysonotis*, for *E. arienis*, n. sp., Solomon Is., p. 365, pl. xxxii, fig. 6; DRUCE, P. Z. S. 1891.

*Epitola pinodes*, figs. 1 & 2, *staudingeri*, figs. 3 & 4, *zelica*, figs. 5 & 6, *dunia* (as *leonina*) figs. 7 & 8, *badura*, figs. 9 & 10, *perdita*, figs. 11 & 12, figured; SMITH & KIRBY, Rhop. ex. *Lycænidae* (African), pl. xiii.

*Erikssonia*, n. g., near *Zeritis*, p. 91, for *E. acraïna*, n. sp., S. W. Africa, p. 92, pl. ix, figs. 18–20; TRIMEN, P. Z. S. 1891.

*Feniseca tarquinius*, note on its carnivorous habits; PATTON, p. 67, Canad. Ent. xxiii.

*Flos ahamus*, Upper Assam, DOHERTY, p. 33, pl. i, fig. 6, J. A. S. B. lx, pt. 2, n. sp.

*Gerydus boisduvalii* n. var. *acragas*; DOHERTY, p. 186, J. A. S. B. lx. *G. irroratus* n. var. *assamensis*; DOHERTY, p. 37, pl. i, fig. 7, t. c.

*G. heracleion*, Perak, DOHERTY, p. 36, J. A. S. B. lx, pt. 2; *G. teos*, Sumba, DOHERTY, p. 185, t. c.; *G. maximus*, Celebes, HOLLAND, p. 68, pl. v, fig. 9, P. Bost. Soc. xxv : n. spp.

*Hewitsonia kirbyi*, Dew., = (*preussi*, Stgr.), figured, pl. iii, fig. 2; AURIVILLIUS, p. 218, Ent. Tidskr. xii.

*H. similis* = (*boisduvali*, ♀, Hew.), Africa, AURIVILLIUS, p. 218, pl. iii, fig. 3, Ent. Tidskr. xii; *H. preussi*, W. Africa, STAUDINGER, p. 139, Deutsche e. Z. Lep. iv : n. spp.

*Holochila albosericea*, Rockhampton, MISKIN, p. 65, Ann. Queensland Mus. i; *H. (Polyommatus) translucens*, N. Australia, *cæruleolactea*, Queensland, LUCAS (545) : n. spp.

*Hypochrysops*: monograph of the species, H. H. DRUCE, Tr. E. Soc. 1891, pp. 179, &c., with figures of the following species—*hypocletus*, pl. x, fig. 1, *rex*, figs. 2 & 3, *halyæus*, figs. 4 & 5, *delicia*, figs. 6 & 7, *hypates*, figs. 8 & 9, *cælisparvus*, figs. 10 & 11, *eucletus*, figs. 12 & 13, *protogenes*, figs. 14 & 15, *pythias*, pl. xi, fig. 1, *theon*, figs. 9 & 10, *herdonius*, figs. 13 & 14, *hippuris*, figs. 11 & 12.

*H. apollo*, Australia, MISKIN, p. 85, Ann. Queensland Mus. i; *H. rovena*, Northern Australia, DRUCE, p. 184, *cratevas*, pl. x, figs. 16 & 18, *architas*, pl. xi, figs. 2 & 3, SALVIN, p. 191, *seuthes*, SALVIN, p. 192, figs. 4 & 5, *alyattes*, SALVIN, p. 193, figs. 6 & 8, Solomon Is., Tr. E. Soc. 1891 : n. spp.

*Hypokopelates*, n. g., for *Hypolycæna mera*, Hew.; H. H. DRUCE, p. 364, Ann. N. H. (6) vii.

*Hypolycæna* (sub *Iolaus*) *cæculus*, Hopf., noticed, p. 85, figured, pl. ix, fig. 14; TRIMEN, P. Z. S. 1891.

*H. nobilis*, p. 149, pl. i, fig. 8, *debilis*, p. 150, *gracilis*, p. 152, pl. i, fig. 9, *simplex*, p. 153, W. Africa, STAUDINGER, Deutsche e. Z. Lep. iv; *H. festata*, Lower California, WEEKS, p. 102, Ent. News, ii : n. spp.

*Hypomyrina*, n. g., for *Myrina nomenia*, Hew.; H. H. DRUCE, p. 364, Ann. N. H. (6) vii.

*Hyreus cordatus*, E. Africa, SHARPE, p. 636, pl. xlviii, fig. 4, P. Z. S. 1891, n. sp.

*Ialmenes evagoras*, pupa described; EDWARDS, Vict. Nat. vii, p. 22.

*Iolaus* restricted and divided; DRUCE, pp. 139, &c., Ann. N. H. (6) viii.

*I. julianus*, p. 144, pl. i, fig. 2, *julius*, p. 146, *ælianus*, p. 148, Sierra Leone, STAUDINGER, Deutsche e. Z. Lep. iv : n. spp.

*Iraota johnsoniana*, Celebes, HOLLAND, p. 73, P. Bost. Soc. xxv, n. sp.

*Iris*, n. g., for *I. incredibilis*, n. sp., Sierra Leone; STAUDINGER, p. 141, Deutsche e. Z. Lep. iv.

*Jamides amaraugae*, p. 366, pl. xxxi, figs. 20 & 21, *scæmius*, pl. xxxii, figs. 4 & 5, *cephion*, pl. xxxi, fig. 19, p. 367, Solomon Is.; DRUCE, P. Z. S. 1891, n. spp.

† *Kopelutes*, n. g., p. 364, for *K. virgata*, n. sp., Sierra Leone, p. 365; II. H. DRUCE, Ann. N. H. (6) vii.

*Lampides lutimargus*, Sn, characters and synonymy of this species and allies discussed, pp. 364–367, figured, pl. f, fig. 15; *aratus*, Cr., = (*masu*, Doh.), p. 366; *kankena*, Feld., = (*insularis*, Rüb.), p. 365; *philatus*, Sn., figured, fig. 16, described, p. 368; NICÉVILLE, J. Bomb. N. H. Soc. vi. *L. subditus* n. var. *telanjang*; DOHERTY, p. 28, J. A. S. B. lx, pt. 2.

*L. bochides*, Malay Penins. and Arch., NICÉVILLE, p. 367, pl. f, fig. 15, J. Bomb. N. H. Soc. vi; *L. elpidion*, Engano, DOHERTY, p. 28, J. A. S. B. lx, pt. 2; *L. anops*, pl. ii, fig. 10, p. 183, *masu*, fig. 11, p. 184, Sumba, *id. t. c.*; *L. areas*, Solomon Is., DRUCE, p. 368, pl. xxxii, figs. 7 & 8, P. Z. S. 1891 : n. spp.

*Larinopoda soyauxi*, figured; SMITH & KIRBY, Rhop. ex. *Lycænidae* (African), xii, figs. 9 & 10.

*Logania massalia*, Upper Assam, DOHERTY, p. 37, pl. i, fig. 8, J. A. S. B. lx, pt. 2, n. sp.

*Lycæna alexis*, var. noticed; OBERTHUR, p. clxii, Bull. Soc. Ent. Fr. 1891. *L. cyllarus*, Rott., n. var. *andereggi*; RÜHL, Soc. Ent. vi, p. 51. *L. argus* n. var. *calmuca*, *sifanica*, *ganssuensis*, p. 450, *orion* n. var. *orithyia*, *tengstroemi* n. var. *tangutica*, *iliensis*, p. 452, *eros* n. var. *lama*, *venus* n. var. *sinina*, *myrrha* n. var. *helena*, p. 453; GROUM-GRSHIMAÏLO, Hor. Ent. Ross. xxv. *L. eurypilus*, *zephyrus*, *argus*, *admetus*, *ripartii*, *dolus*, and *menalcas*, specific validity or identity discussed; ALPHERAKY, Tr. E. Soc. 1891, pp. 499–502. *L. antanossa*, Mab., characters discussed; TRIMEN, p. 174, *t. c.*

*L. æquatorialis*, E. Africa, SHARPE, p. 637, pl. xlvi, fig. 5, P. Z. S. 1891; *L. paludicola*, W. Africa, HOLLAND, p. 52, Psyche, vi; *L. ægina*, *themis*, *ida*, p. 451, *orbona*, p. 452, *dis*, *napæa*, p. 453, Central Asia, GROUM-GRSHIMAÏLO, Hor. Ent. Ross. xxv; *L. ion*, W. China, LEECH, Ent. xxiv, Supp. p. 58; *L. tenella*, Queensland, MISKIN, p. 63, Ann. Queensland Mus. i; *L. pallida*, New Guinea, *id.* (595) p. 122; *L. andicola*, Ecuador, GODMAN & SALVIN, in Whympers Supp. App. p. 104 : n. spp.

*Lycænesthes* (*Pseudodipsas*) *dewitzi*, Sierra Leone, p. 155, pl. i, fig. 10, STAUDINGER, Deutsche e. Z. Lep. iv; *L. scintillula*, p. 50, *regillus*, *lychnaptes*, *rubricinctus*, p. 51, *tisamenus*, p. 52, W. Africa, HOLLAND, Psyche, vi; *L. neglecta*, Natal, TRIMEN, p. 175, Tr. E. Soc. 1891 : n. spp.

*Massaga* : note on characters of the males; DOHERTY, p. 35, J. A. S. B. lx, pt. 2.

† *Micandra*, n. g., for *Thecla platyptera*, Feld.; SCHATZ, Exot. Schmett. Theil ii, p. 265.

† *Miletographa*, n. g., for *Miletus drumila*, Moore; RÜBER, p. 277, Exot. Schmett. Theil ii.

*Myrina nomion*, Sierra Leone, STAUDINGER, p. 156, Deutsche e. Z. Lep. iv (an *nomenia* var. ?), n. sp.

*Nacaduba felderi* and *nora*, distinctions noticed, p. 359; *N. astarte* figured, pl. xxxii, fig. 10; DRUCE, P. Z. S. 1891.

*N. stratola*, W. Africa, HOLLAND, Psyche, vi, p. 52; *N. gaura*, pl. ii, fig. 8, p. 181, *laura*, fig. 9, Sumba, *pseustis*, Borneo, p. 182, DOHERTY, J. A. S. B. lx; *M. plumbata*, p. 359, pl. xxxi, figs. 3 & 4, *ugiensis*, fig. 5, *euretes*, figs. 6 & 7, p. 360, *korene*, fig. 8, *amaura*, fig. 10, *maniana*, fig. 9, *ligamenta*, figs. 11 & 12, p. 361, *keiria*, figs. 13 & 14, p. 362, *vincula*, fig. 18, p. 363, Solomon Is., DRUCE, P. Z. S. 1891: n. spp.

*Paragerydus macassarensis*, Celebes, HOLLAND, p. 70, pl. iv, fig. 5, P. Bost. Soc. xxv, n. sp.

✓ *Parapontia*, n. g., for *Liptena undularis*, Hew.; RÜBER, p. 280, Exot. Schmett. Theil ii.

*Pentila flavicans*, figs. 5-8, *ferrymani*, figs. 11 & 12, Trop. Africa, SMITH & KIRBY, Rhop. ex. *Lycænidae* (African), pl. xii, p. 50, n. spp.

✓ *Phengaris*, n. g., for *Lycæna atroguttata*, Oberth.; DOHERTY, p. 36, J. A. S. B. lx, pt. 2.

✓ *Pilodeudorix*, n. g., near *Rapala*, for *P. barbatus*, n. sp., Sierra Leone; H. H. DRUCE, p. 366, Ann. N. H. (6) vii.

*Pithecopa dionisius*, pl. xxxi, fig. 1, and var. *steirema*, fig. 2, figured; DRUCE, P. Z. S. 1891.

*Polycæna lua*, Central Asia, GROUM-GRSHIMAÏLO, p. 454, Hor. Ent. Ross. xxv, n. sp.

*Polyommatus standfussi*, Central Asia, GROUM-GRSHIMAÏLO, Hor. Ent. Ross. xxv, p. 450, n. sp.

✓ *Prosotas*, n. g. near *Nacaduba*, for *P. caliginosa*, n. sp., Solomon Is., pl. xxxi, fig. 15; DRUCE, p. 366, P. Z. S. 1891.

*Pseudaletia zebra*, W. Africa, HOLLAND, p. 50, Psyche, vi, n. sp.

*Pseuderesia debora*, figs. 1 & 2, *turbata*, figs. 13 & 14, *similis*, figs. 3 & 4, *cellularis*, figs. 5-8, *dinora*, figs. 9-12, figured; SMITH & KIRBY, Rhop. ex. *Lycænidae* (African), pl. xiv.

*Rapala refulgens*, Khasi Hills, NICÉVILLE, p. 376, pl. f, fig. 18, J. Bomb. N. H. Soc. vi, n. sp.

*Satsuma*, Murr., merged in *Thecla*; NICÉVILLE, p. 375, J. Bomb. N. H. Soc. vi.

*Simiskina*, Dist., = (*Massaga*, Doh.), characters of the allied genera, pp. 360 & 361, *S. pharyge* figured, pl. f, fig. 11; NICÉVILLE, J. Bomb. N. H. Soc. vi.

*Sinthusa aspra*, Java, DOHERTY, p. 180, J. A. S. B. lx, n. sp.

*Sithon*? (*Pseudaletia*?) *tricolor*, Cameroons, p. 143, pl. i, fig. 5, STAUDINGER, Deutsche e. Z. Lep. iv, n. sp.

✓ *Stugeta*, n. g.; type, *Iolaus bowkeri*, Trim.; H. H. DRUCE, p. 149, Ann. N. H. (6) viii.

✓ *Sukidion*, n. g., for a part of *Iolaus*; H. H. DRUCE, p. 142, Ann. N. H. (6) viii.

✓ *Tannetheira*, n. g. p. 148; type, *P. timon*, Fab., and including *T. pro-metheus*, n. sp., Sierra Leone, p. 149; H. H. DRUCE, Ann. N. H. (6) viii.

*Tarucus cluthratus*, Colobos, HOLLAND, p. 71, P. Bost. Soc. xxv, n. sp.

*Thecla rubi*, food-plants ; PRIDEAUX, Ent. M. M. (2) ii, p. 249. *T. rubi*, aberr. (? forma) *immaculata* ; FUCHS, JB. nass. Ver. xlv, pp. 211-215.

*T. patrius*, W. China, LEECH, Ent. xxiv, Supp. p. 58, n. sp.

*Thrix*, n. g., for *Neocheritra gama*, Dist. ; DOHERTY, p. 35, J. A. S. B. lx, pt. 2.

*Thysonotis kruera*, pl. xxxi, figs. 16 & 17, *cepheis*, pl. xxxii, figs. 1 & 2, p. 364, *chromia*, fig. 3, p. 365, Solomon Is., DRUCE, P. Z. S. 1891, n. spp.

*Tingra laura*, figs. 1-3, *lavinia*, figs. 4 & 5, *fatima*, figs. 8 & 9, *preussi*, figs. 10-12, *paucipunctata* (as *Pseuderesia*), figs. 6 & 7, figured ; SMITH & KIRBY, Rhop. ex. *Lycanidæ* (African), pl. xv.

*Zeritis bicolor*, Sierra Leone, SHARPE, p. 241, Ann. N. H. (6) viii ; *Z. damarensis*, S. W. Africa, TRIMEN, p. 90, pl. ix, fig. 17, P. Z. S. 1891 ; *Z. oreas*, Natal, TRIMEN, p. 176, Tr. E. Soc. 1891 : n. spp.

### HESPERIIDÆ.

Descriptions East Indian *Hesperiidæ* ; WATSON (941).

*Abantis venosa*, Trim., = (*Leucochitonea umvulensis*, Sharpe), p. 105, figured, pl. ix, fig. 24 ; TRIMEN, P. Z. S. 1891. *A. leucogaster*, Mab., pl. iii, fig. 5, *elegantula*, Mab., fig. 6, figured and described, pp. 22 & 23 ; MABILLE & VUILLOT, Nov. Lep.

*Abaratha alida*, Burma, NICÉVILLE, p. 394, pl. g, fig. 40, J. Bomb. N. H. Soc. vi ; *A. hypicides*, Sambawa, DOHERTY, p. 195, J. A. S. B. lx : n. spp.

*Achlyodes halidus*, Merida, autander, Buenos Ayres, besa, hab. ?, p. lxvi, MABILLE, C.R. Ent. Belg. xxxv, n. spp.

↓ *Alera*, n. g., near *Proteides*, for *A. furcata*, n. sp., Brazil ; MABILLE, p. lxxxiv, C.R. Ent. Belg. xxxv.

*Anastrus subchalybeus*, Manaos, MABILLE, pl. lxiii, C.R. Ent. Belg. xxxv, n. sp.

*Ancistrocampta chrysoglossa*, Cameroons, MABILLE, p. cvii, C.R. Ent. Belg. xxxv, n. sp.

*Ancyloxiapha xanthina*, Valera, MABILLE, p. lxxxiv, C.R. Ent. Belg. xxxv, n. sp.

*Antigonus jamesoni*, Sharpe, figured, pl. ix, fig. 25, redescribed and referred to *Pterygospidea* ; TRIMEN, p. 106, P. Z. S. 1891.

*A. cæcatus*, Brazil, *cupreiceps*, Honduras, MABILLE, p. lxiii, C.R. Ent. Belg. xxxv, n. spp.

*Astictopterus subfasciatus*, synonymy discussed ; NICÉVILLE, J. Bomb. N. H. Soc. vi, p. 396.

*Butleria polydesma*, *quadristriga*, p. lxxv, *riza*, p. lxxvi, Colombia, MABILLE, C.R. Ent. Belg. xxxv, n. spp.

*Calliana pieridoides*, Moore, redescribed, p. 377, ♀ figured, pl. g, fig. 25, J. Bomb. N. H. Soc. vi.

*Carterocephalus ops*, *christophi*, Central Asia, GROUM-GRSHIMAÏLO, p. 460, Hor. Ent. Ross. xxv ; *C. gemmatus*, W. China, LEECH, Ent. xxiv, Supp. p. 59 ; *C. demea*, pl. iii, fig. 24, T'a-Tsien-Lou, *micio*, Tsé-Kou, fig. 29, OBERTHUR, p. 19, Études d'Ent. xv : n. spp.

*Carystus superbiens*, Brazil, p. cxiv, *periphas*, Massauary, *tetragraphus*, Amboyna, *dyscritus*, Rio San Juan, p. cxv, *hebon*, Massauary, *lysoteles*, Saragara, *quadrum*, Colombia, *paculla*, Brazil, p. cxvi, *xanthias*, Lagos, *abalus*, Colombia, *metaura*, p. cxvii, *vividus*, marsa, p. cxviii, Brazil, *abaris*, Porto-Cabello, *micon*, Brazil, *lanas*, Philippines, *epidius*, Chiriqui, p. cxix, *hypargus*, Manaos, *mæon*, Chiriqui, *furcifer*, Brazil, p. cxx, MABILLE, C.R. Ent. Belg. xxxv, n. spp.

*Cecropterus electrus*, Chanchamayo, p. lxxvi, *dhega*, Jalapa, *integrifascia*, Brazil, p. lxxvii, MABILLE, C.R. Ent. Belg. xxxv, n. spp.

*Celenorrhinus clitus*, Assam, NICÉVILLE, p. 378, J. Bomb. N. H. Soc. vi; *C. consanguinea*, *aspera*, W. China, LEECH, Ent. xxiv, Supp. p. 61 : n. spp.

*Ceratrachia quaterna*, Mab., figured ; MABILLE & VUILLOT, p. 20, pl. iii, fig. 3, Nov. Lep.

*C. stellata*, *semilutea*, *tetrastigma*, Trop. Africa, MABILLE, p. lxxv, C.R. Ent. Belg. xxxv, n. spp.

*Chapra cære*, Burma, NICÉVILLE, p. 388, pl. G, fig. 33, J. Bomb. N. H. Soc. vi, n. sp.

*Cobalus atrio*, Cameroons, *chrysophrys*, Colombia, *stigmula*, hab. ?, p. lxxxii, *ludens*, *illudens*, Chiriqui, p. lxxxiii, MABILLE, C.R. Ent. Belg. xxxv, n. spp.

*Coladenia maculata*, E. Africa, HAMPSON, p. 183, Ann. N. H. (6) vii, n. sp.

*Copæodes candida*, California, WRIGHT, P. Cal. Ac. Sci. (2) iii, p. 34, n. sp.

*Cyclopides amena*, Madagascar, SMITH, Ann. N. H. (6) vii, p. 127 ; *O. sacclavus*, Madagascar, MABILLE, p. cvii, C.R. Ent. Belg. xxxv ; *C. metius*, Porto Cabello, *celeus*, Villa Bella, p. lxxiv, *etura*, Hong Kong, p. lxxv, MABILLE, C.R. Ent. Belg. xxxv : n. spp.

*Eagris decastigma*, Sierra Leone, MABILLE, p. lxii, C.R. Ent. Belg. xxxv, n. sp.

*Eretis*, n. g., for *E. melania*, n. sp., MABILLE, p. lxxi, C.R. Ent. Belg. xxxv.

*Erionota holocausta*, Cameroons, MABILLE, p. cxi, C.R. Ent. Belg. xxxv, n. sp.

*Erycides tophana*, Plötz, figured, pl. v, fig. 4, *xanthothrix*, Mab., fig. 5, *tenebricosa*, Hew., fig. 6 ; MABILLE & VUILLOT, Nov. Lep.

*E. xanthothrix*, Hunyabamba, MABILLE, p. lx, C.R. Ent. Belg. xxxv, n. sp.

*Eudamus simplex*, *proximus*, W. China, LEECH, Ent. xxiv, Supp. p. 58 ; *E. frater*, pl. i, fig. 3, *gener*, fig. 2, Yunnan, OBERTHUR, Études d'Ent. xv : n. spp.

*Eurypterus haber*, p. lxxix, *later*, p. lxxx, Peru ?, MABILLE, C.R. Ent. Belg. xxxv, n. spp.

*Buschemon rafflesiae* n. var. *albo-ornatus* ; OLLIFF, p. 30, P. Linn. Soc. N.S.W. (2) vi.

*Goniurus*, Hub., to be used in place of *Eudamus*, Swains. ; MABILLE & VUILLOT, p. 25, Nov. Lep. The following species figured : *megacles*,

Mab., pl. iv, fig. 1, *asine*, fig. 2, = (*caunus*, H.-S.), p. 27, *concinus*, Mab., fig. 3, *callias*, Mab., fig. 5, *auginus*, Hew., fig. 6, *evenus*, Men., fig. 7, *ganna*, Mosch., fig. 8, *albimargo*, Mab., pl. v, fig. 2, *carmelita*, H.-S., fig. 3.

*G. cinereus*, Brazil, p. 29, pl. iv, fig. 4, *latipennis*, Cayenne, p. 36, pl. v, fig. 1, MABILLE & VUILLOT, Nov. Lep.; *G. piliger*, Itaituba, MABILLE, p. lx, C.R. Ent. Belg. xxxv : n. spp.

*Halpe hyrie*, Naga Hills, p. 388, pl. g, fig. 34, *albipectus*, Burma, p. 389, figs. 35 & 36; NICÉVILLE, J. Bomb. N. H. Soc. vi : n. spp.

*Hesperia ploetzi* = (*spio*, Plötz, nec L.), W. Africa, AURIVILLIUS, p. 227, Ent. Tidskr. xii, n. sp.

*Hesperilla senta*, Australia, MISKIN, p. 85, Ann. Queensland Mus. i; *H. atrax*, *saxula*, *melissa*, p. lxxxi, *satulla*, p. lxxxii, Australia, MABILLE, C.R. Ent. Belg. xxxv : n. spp.

*Hyda tricerata*, p. cvi, *majorella*, p. cvii, Sierra Leone, MABILLE, C.R. Ent. Belg. xxxv, n. spp.

† *Hypoleucis*, n. g., for *H. tripunctata*, *arela*, n. spp., W. Africa; MABILLE, p. lxix, C.R. Ent. Belg. xxxv.

*H. indusiata*, Victoria, MABILLE, p. cxiii, C.R. Ent. Belg. xxxv, n. sp.

*Isma inarime*, Perak, NICÉVILLE, p. 391, pl. g, fig. 38, J. Bomb. N. H. Soc. vi, n. sp.

*Ismene hanno*, Plötz, figured; MABILLE & VUILLOT, pl. iii, fig. 1, p. 18, Nov. Lep.

*I. sejuncta*, Usagara, MABILLE & VUILLOT, p. 19, pl. iii, fig. 2, Nov. Lep.; *I. atrinota*, Timor, *renidens*, Minah, *rubrocincta*, Celebes?, p. lxxviii, *umbrina*, *leucospila*, Minah, p. lxxix, MABILLE, C.R. Ent. Belg. xxxv; *I. strophius*, New Guinea, MISKIN, (595) p. 123 : n. spp.

*Leucochitonea fuscescens*, Honduras, p. lxi, *charemon*, Brazil, MABILLE, p. lxii, C.R. Ent. Belg. xxxv, n. spp.

† *Narga*, n. g., for *N. chiriquensis*, Chiriqui, *vidius*, Rio Grande do Sul, *scopas*, Merida, n. spp.; MABILLE, p. lxx, C.R. Ent. Belg. xxxv.

*Netrocoryne repandu*, ♀ figured, pl. xiv, metamorphoses described, p. 12; SCOTT, Austral. Lep. ii.

*Nisionades tages* n. var. *sinina*; GROUM-GRSHIMAÏLO, p. 461, Hor. Ent. Ross. xxv.

*N. erebus*, Central Asia, GROUM-GRSHIMAÏLO, p. 461, Hor. Ent. Ross. xxv; *N. pelias*, W. China, LEECH, Ent. xxiv, Supp. p. 60 : n. spp.

*Notocrypta signata*, Druce, redescribed and specific validity asserted, generic position queried; NICÉVILLE, pp. 380–382, J. Bomb. N. H. Soc. vi.

*N. neera*, Perak, NICÉVILLE, p. 379, pl. vi, fig. 27, J. Bomb. N. H. Soc. vi, n. sp.

† *Nyctus*, n. g., for *N. crinitis*, n. sp., Pebas; MABILLE, p. cxiv, C.R. Ent. Belg. xxxv.

† *Odina*, n. g., for *O. chrysomelæna*, n. sp., Celebes; MABILLE, p. cxiii, C.R. Ent. Belg. xxxv.

*Padraona palmarum* n. var. *kayapu*; DOHERTY, p. 32, J. A. S. B. lx, pt. 2.

*Pumphila phineus*, ♂ ♀ larva figured, pl. xiv, noticed, p. 12; SCOTT,



Austral. Lep. ii. *P. comma* n. var. ? *lato* ; GROOM-GRSHIMAÏLO, p. 459, Hor. Ent. Ross. xxv. *P. ethlius*, larva and pupa described ; COCKERELL, p. 29, J. Inst. Jamaica, i.

*P. obumbrata*, pl. ix, fig. 23, *occulta*, S.W. Africa, TRIMEN, p. 103, P. Z. S. 1891 ; *P. pulchra*, W. China, LEECH, Ent. xxiv, Supp. p. 59 ; *P. nox*, Victoria, *leptosema*, Rio Grande, p. clxviii, *holomelas*, Pebas, *gagatina*, Brazil ? , *integra*, Honduras, Colombia, *subsordida*, Honduras, p. clxix, *puzillius*, Mexico, *derisor*, Venezuela, *edda*, Chiriqui, p. clxx, *asema*, Honduras, *ochroneura*, Massauary, *parilis*, Centr. America, *sosia*, Mozambique, p. clxxi, *gisgon*, Ogouvé, *chrysaugæ*, Loko, *voranus*, p. clxxii, *ænararchus*, Colombia, *misius*, Massauary, p. clxxiii, *insularis*, I. of St. Thomas, *meton*, Teffé, *trebius*, Bogota, p. clxxiv, *suffenas*, Porto Cabello, *jheringii*, Rio Grande do Sul, *valo*, Bogota, p. clxxv, *vala*, Chiriqui, *nubila*, Porto Cabello, *astur*, Coary, *cleochares*, Valera, p. clxxvi, *sigida*, Australia, *oblinita*, Brazil, *neocles*, Cooktown, p. clxxviii, *neoba*, Cameroons, *heterophyla*, Natal, *amadhu*, Transvaal, p. clxxviii, *euryspila*, *chameleon*, *tarace*, p. clxxix, *statira*, Sierra Leone, *icteria*, Transvaal, *gyas*, Minahassa, p. clxx, *surus*, Chaata, *satriana*, Amboyna, *fallacina*, Cherra-Pungi, p. clxxxi, *lagon*, Cooktown, *actor*, Chiriqui, *agassus*, Massauary, p. clxxxii, *ruso*, Zanzibar, *jopas*, Batjan, *amyrna*, Porto Cabello, p. clxxxiii, *binaria*, Merida, *hycsos*, Colombia, *portensis*, Porto Rico, *flaveola*, Porto Cabello, p. clxxxiv, *insidiosa*, Chiriqui, *rivula*, Teffé, p. clxxxv, MABILLE, C.R. Ent. Belg. xxxv ; *P. panoquinoides*, Texas, &c., SKINNER, Ent. News, ii, p. 175 : n. spp.

*Paraleodes illustris*, *interniplaga*, p. lxxiii, *atratus*, p. lxxiv, Cameroons, MABILLE, C.R. Ent. Belg. xxxv, n. spp.

*Parnara pugnans*, p. 384, pl. g, fig. 30, *miosticta*, p. 385, fig. 31, Malay Penins., *P. ? meiktilla*, Burma, p. 386, fig. 32, NICÉVILLE, J. Bomb. N. H. Soc. vi, n. spp.

*Pellicia violacea*, hab. ? MABILLE, p. lxxvi, C.R. Ent. Belg. xxxv, n. sp.

*Phlebodes storax*, Chiriqui, *seriatus*, Valera, p. lxxxiii, MABILLE, C.R. Ent. Belg. xxxv, n. spp.

*Pholisora hayhursti*, larva described ; DYAR, Ins. Life, iii, p. 389.

*Plastingia ogowena*, W. Africa, MABILLE, p. cxxi, C.R. Ent. Belg. xxxv, n. sp.

✓ *Plesiocera*, n. g., for *P. filipalpis*, n. sp., without locality ; MABILLE, p. cvi, C.R. Ent. Belg. xxxv.

*Plesioneura hoehneli*, Trop. Africa, ROGENHOFER, p. 463, pl. xv, fig. 10, Ann. Hofmuseum Wien, vi, n. sp.

*Proteides galua*, p. 3, *benga*, p. 4, *balenge*, p. 5, W. Africa, HOLLAND, Ent. News, ii ; *P. massiva*, Sierra Leone, MABILLE & VUILLOT, p. 21, pl. iii, fig. 4, Nov. Lep. ; *P. hundurensis*, *laurens*, Centr. America, *radiatus*, *cicus*, Brazil, p. lxxxv, *hyas*, Cauca, *argyrostactos*, Brazil, p. lxxxvi, *ampyx*, Chiriqui, *midia*, Merida, *milo* (= *subcordatus*, Mab., nec auct.), *stilio*, Chiriqui, p. lxxxvii, *cæso*, Brazil, p. lxxxviii, MABILLE, C.R. Ent. Belg. xxxv ; *P. rynchus*, *xantho*, W. Africa, *leucopogon*, Victoria, p. cxi, *xanthargyra*, *binævatus*, *dilissimus*, W. Africa, p. cxii, *id. t. c.* : n. spp.

*Pyrgus alveus*, n. var. *sifanicus*; Groum-GRSHIMAÏLO, p. 459, Hor. Ent. Ross. xxv.

*P. saccus*, S. W. Africa, TRIMEN, p. 102, pl. ix, fig. 22, P. Z. S. 1891; *P. pelagica*, Lower California, WEEKS, Canad. Ent. xxiii, p. 126 : n. spp.

*Pterygospidea extensa*, Hunyabamba, MABILLE, p. lxxi, C.R. Ent. Belg. xxxv; *P. (Tagiades) lugens*, p. 462, *P. morosa*, p. 463, Trop. Africa, ROGENHOFER, Ann. Hofmuseum Wien, vi : n. spp.

*Pyrrhopyga persela*, Cauca, p. cvii, *cardus*, Brazil, *hyleus*, *thericles*, Amazons, p. cix, *pallens*, *erythrosoma*, *aurora*, Brazil, p. cix, *alburna*, Chanchamayo, *initator*, Bogota, p. cx, MABILLE, C.R. Ent. Belg. xxxv, n. spp.

*Pythonides nolckeni*, Bogota, p. lxiv, *lusorius*, Rio de Janeiro, p. lxv, MABILLE, C.R. Ent. Belg. xxxv : n. spp.

*Saucus*, n. g., for *Astictopterus subfusciatus*, Moore; NICÉVILLE, p. 395, J. Bomb. N. H. Soc. vi.

*Sape*, n. g., for *S. lucidella*, Zanzibar, *semialba*, W. Africa, p. lxvii, *maculata*, Mozambique, *ophthalmica*, Delagoa Bay, *pertusa*, Transvaal, p. lxviii, MABILLE, C.R. Ent. Belg. xxxv, n. spp.

*Sarangesa sati*, E. India, NICÉVILLE, p. 391, pl. g, fig. 37, J. Bomb. N. H. Soc. vi, n. sp.

*Spilothyrus altheæ*, var. *baticus*, in Switzerland; KNECHT, MT. Schw. ent. Ges. viii, p. 269.

*Steropes tripunctatus*, Chili, *nubilis*, Hongkong, *monochromus*, Transvaal, MABILLE, p. lxiv, C.R. Ent. Belg. xxxv, n. spp.

*Sunastus chilon*, Sumba, DOHERTY, p. 196, J. A. S. B. lx, n. sp.

*Syrichthus maculatus*, n. var. *thibetanus*; OBERTHUR, p. 20, pl. iii, fig. 27, Études d'Ent. xv.

*S. oberthuri*, W. China, LEECH, Ent. xxiv, Supp. p. 59; *S. delavayi*, Yunnan, OBERTHUR, p. 20, pl. iii, fig. 31, Études d'Ent. xv : n. spp.

*Tagiades samborana*, Madagascar, SMITH, Ann. N. H. (6) vii, p. 127; *T. tripura*, Perak, NICÉVILLE, p. 392, pl. g, fig. 39, J. Bomb. N. H. Soc. vi; *T. brasidas*, Sumba, DOHERTY, p. 195, J. A. S. B. lx; *T. xarea*, Timor, *korela*, Waigiou, *australensis*, Australia, p. lxxii, *karea*, Luzon, p. lxxiii, MABILLE, C.R. Ent. Belg. xxxv : n. spp.

*Tapena* : note on the species pertaining to it, p. 383, *T. lazmi*, figured, pl. g, fig. 28; NICÉVILLE, J. Bomb. N. H. Soc. vi.

*Taractrocera trimacula*, *lyde*, W. China, LEECH, Ent. xxiv, Supp. p. 60; *T. barius*, Timor, *talantus*, Mangkassar, *myconius*, Amboyna, MABILLE, p. clxxxvi, C.R. Ent. Belg. xxxv : n. spp.

*Telemiades hybridus*, Brazil, MABILLE, p. lxi, C.R. Ent. Belg. xxxv, n. sp. *Telicota subrubra*, Celebes, HOLLAND, p. 79, pl. iv, fig. 4, P. Bost. Soc. xxv, n. sp.

*Thymele anthius*, Hunyabamba, MABILLE, p. lxi, C.R. Ent. Belg. xxxv, n. sp.

*Toxidia*, n. g., to be placed before *Hesperilla*, for *T. thyrrhus*, n. sp., Cooktown; MABILLE, p. lxxx, C.R. Ent. Belg. xxxv.

## HETEROCERA.

Food-plants of many species of *Bombycidae* and *Noctuidæ*; THAXTER, Canad. Ext. xxiii, pp. 34-36.

For figures of some of the species described of late years in Le Nat. by Dognin; see DOGNIN (194).

*Lafajana*, n. g., position not stated, p. 257, for *L. cupra* (sic), n. sp.; Loja; DOGNIN, Le Nat. 1891.

## SPHINGIDÆ.

[Cf. DOGNIN (193), GROOM-GRSHIMAÏLO (355), KARSCH (445, 446), LUCAS (545).]

*Cequesa australasiæ*, pupa described; EDWARDS, Vict. Nat. vii, p. 22.

*Cherocampa tersa*, larva described; BEUTENMULLER, Ent. News, ii, p. 153. *C. elpenor*, note on its caudal horn; SNELLEN, Tijdschr. Ent. xxxiv, pp. xiii-xv.

*C. curvilinea*, *luteotincta*, *queenslandi*, Queensland, LUCAS (545), n. spp.

*Deidamia inscripta*, larva described; SOULE, Psyche, vi, p. 116.

*Deilephila galii*, as a resident in England; TUGWELL, Ent. M. M. (2) ii, p. 5.

*Dewitzia pyarga*, Cameroons, KARSCH, p. 295, Ent. Nachr. xvii, n. sp.

*Euryglottis davidianus*, Loja, DOGNIN, Le Nat. 1891, p. 159, n. sp.

*Hemaris diffinis*, life history; SOULE, Psyche, vi, pp. 142-145.

*Lepisesia flavofasciata*, early stages of; BRAUN, Ent. News, ii, pp. 87 & 109; larva described; BRUCE, p. 42, Canad. Ent. xxiii.

*Leucophlebia afra*, W. Africa, KARSCH, p. 12, pl. i, fig. 1, Ent. Nachr. xvii, n. sp.

*Macroglossa ganssuensis*, Central Asia, GROOM-GRSHIMAÏLO, p. 461, Hor. Ent. Ross. xxv; *M. approximans*, *tenebrosa*, *lineata*, Queensland, LUCAS (545): n. spp.

*Nephele pineus* n. var. *discifera*; KARSCH, p. 298, Ent. Nachr. xvii.

*Ocyton preussi*, p. 292, *aureata*, p. 293, Cameroons, KARSCH, Ent. Nachr. xvii, n. spp.

*Panucra turneri*, Queensland, LUCAS (545), n. sp.

*Polyptychus digitatus*, W. Africa, KARSCH, p. 14, pl. i, fig. 3, Ent. Nachr. xvii, n. sp.

*Pseudenyo apicipilaga*, Cameroons, KARSCH, p. 291, Ent. Nachr. xvii, n. sp.

*Pseudosphinx tetrio*, larva and pupa described; COCKERELL, p. 30, J. Inst. Jamaica, i.

*Rhadinopasa*, n. g., near *Daphnusa*, p. 14, for *R. udei*, n. sp., Cameroons, p. 15, pl. i, fig. 4; KARSCH, Ent. Nachr. xvii. *R. hornimani*, Druce, = (*udei*, Karsch); KARSCH, p. 296, t. c.

*Sphinx distincta*, *eremophile*, Queensland, LUCAS (545), n. spp.

*Triptogon imperator*, larva described; DYAR, Ins. Life, iii, p. 390.

*T. reducta*, W. Africa, KARSCH, p. 13, pl. i, fig. 2, Ent. Nachr. xvii, n. sp.

*Smerinthus exæcatus*, preparatory stages ; BEUTENMULLER, Canad. Ent. xxiii, p. 14. *S. ophthalmicus*, preparatory stages ; FRENCH, Canad. Ent. xxiii, p. 143, and DYAR, *t. c.* p. 200. *S. tilia*, variation in England, with coloured figs. ; CLARK, Ent. Rec. i, p. 327, pl. A.

## ÆGERIIDÆ.

[*Cf.* COTES (162), HAMPSON (369), LUGGER (546), MABILLE (552), NEUMOEGEN (614).]

*Acalthoë cordata*, metamorphoses figured ; *Ins. Life*, iv, p. 220.

*Albuna vitrina*, N.-W. America, NEUMOEGEN, Ent. News, ii, p. 109, n. sp.

*Larunda palmii*, Arizona, NEUMOEGEN, Ent. News, ii, p. 108, n. sp.

*Melittia dorsatiformis*, S. India, HAMPSON, Ill. Lep. Het. viii, p. 43, pl. cxxxix, fig. 21, n. sp.

*Sesia hylas*, a *Macroglossa* that loses its scales ; DÖNITZ, B. E. Z. xxxvi, SB. p. vii.

*S. setodiformis*, Madagascar, MABILLE, p. clxxiv, Bull. Soc. Ent. Fr. 1891, n. sp.

*Sphecia ommatiasformis*, Beluchistan, MOORE, p. 16, Ind. Mus. Notes, ii, n. sp.

*Trochilium luggeri* (Edw.), p. 108, pl. iii, fig. 3, *frazini*, p. 109, pl. iii, fig. 4, N. America, LUGGER, Psyche, vi ; *T. californicum*, California, *minimum*, Colorado, NEUMOEGEN, Ent. News, ii, p. 108 : n. spp.

## URANIIDÆ, COCYTHIDÆ, CASTNIIDÆ, AGARISTIDÆ, CHALCOSIIDÆ.

[*Cf.* BUTLER (117), DRUCE (210, 337), HAMPSON (369), KIRBY (467), MABILLE (553), MEYRICK (582), OBERTHUR (629), POUJADE (664, 666), SWINHÖE (852).]

*Amesia striata*, Borneo, DRUCE, Ann. N. H. (6) vii, p. 142, n. sp.

*Agarista glycine*, young larva described ; EDWARDS, Vict. Nat. vii, p. 23.

*A. lewini*, *glycine*, *donovani*, *latina*, figured, pl. xv, noticed, pp. 14-17 ; SCOTT, Austral. Lep. ii.

*A. platyxantha*, Queensland, p. 194, *tetrapleura*, N. S. Wales, p. 195, MEYRICK, Tr. R. Soc. S. Austr. xiv, n. spp.

*Castnia cronis* n. var. *corningii* ; EDWARDS, *Ins. Life*, iii, p. 316, fig. 29.

*Chalcosia paviei*, Laos, POUJADE, p. liii, Bull. Soc. Ent. Fr. 1891 ; *C. pavici*, Laos, POUJADE, Le Nat. 1891, p. 143 : n. spp.

*Chatamla antianira*, Sumatra, p. 142, *lyra*, Nias I., p. 143, DRUCE, Ann. N. H. (6) vii, n. spp.

*Cocytia* : study of the species, with figures, pp. 42-48, pls. vi & vii, with *mæstifica* n. var. of *d'urvilli* ; MABILLE & VUILLOT, Nov. Lep.

*Coronidia canace*, pl. xli, fig. 13, *echenais*, fig. 15, *interlineata*, fig. 17, figured, Biol. Centr. Am. Heter. ii.

*C. ribbei*, Panama, DRUCE, p. 8, pl. xli, fig. 14, Biol. Centr. Am. Heter. ii, n. sp.

*Elcysma delavayi*, Yunnan, OBERTHUR, p. 21, pl. iii, fig. 22, Études d'Ent. xv, n. sp.

*Epyrgis distant*, Malay Penins., DRUCE, p. 142, Ann. N. H. (6) vii ; *E. cuprea*, Khasia Hills, SWINHÖE, p. 475, Tr. E. Soc. 1891 ; *E. australinda*, S. India, HAMPSON, Ill. Lep. Het. viii, p. 45, pl. cxxxix, fig. 23 : n. spp.

*Eusemia*: synonymical note ; MABILLE, p. clxxxiii, Bull. Soc. Ent. Fr. 1891.

*E. (Xanthospilopteryx) deficiens*, p. clxxxiii, *interniplaga*, *melanochiton*, W. Africa, MABILLE, Bull. Soc. Ent. Fr. 1891 ; *E. indecisa*, Centr. Africa, BUTLER, p. 50, Ann. N. H. (6) vii ; *E. candidemarginata*, Laos, POUJADE, Le Nat. 1891, p. 143 ; *E. candidomarginata*, Laos, POUJADE, p. liii, Bull. Soc. Ent. Fr. 1891 ; *E. latimargo*, S. India, HAMPSON, Ill. Lep. Het. viii, p. 45, pl. cxxxix, fig. 124 : n. spp.

*Gynautocera zara*, Khasia Hills, SWINHÖE, p. 476, Tr. E. Soc. 1891, n. sp.

*Herpa basiflava*, Ta-Tsien-Lou, OBERTHUR, p. 21, pl. iii, fig. 25, Études d'Ent. xv, n. sp.

*Milleria hamiltoni*, Khasia Hills, SWINHÖE, p. 475, Tr. E. Soc. 1891 ; *M. lyra*, Malay Penins., DRUCE, Ann. N. H. (6) vii, p. 143 : n. spp.

*Pompelon phillippensis*, Mindanao, *anethussa*, Malay Penins., DRUCE, Ann. N. H. (6) vii, p. 141, n. spp.

*Pintia latipennis*, S. India, HAMPSON, Ill. Lep. Het. viii, p. 45, pl. cxxxix, fig. 22, n. sp.

*Synemon leucospila*, *heliopis*, p. 188, *austera*, *brontias*, W. Australia, MEYRICK, Tr. R. Soc. S. Austr. xiv, n. spp.

*Trypanophora ancora*, Sumatra, DRUCE, Ann. N. H. (6) vii, p. 140, n. sp.

*Uraniid fulgens* figured, pl. xli, fig. 16, migrations noticed, p. 3 ; DRUCE, Biol. Centr. Am. Heter. ii.

*Xanthospilopteryx*, monograph of ; KIRBY, Tr. E. Soc. 1891, pp. 279, &c. *X. indecisa*, fig. 1, *butleri*, fig. 4, *thruppi*, fig. 5, *incongruens*, figs. 6 & 7, figured, pl. xv ; *t. c.*

*X. fatima* = (*euphemia*, Mab.), p. 288, pl. xv, fig. 2, *aisha*, p. 291, fig. 3, KIRBY, Tr. E. Soc. 1891, n. spp.

## ZYGÆNIDÆ.

[Cf. DOGNIN (190, 196), GROUM-GRSHIMAÏLO (355), HAMPSON (369), HOLLAND (399), SWINHÖE (851, 852).]

*Antichloris flammea*, Ecuador, DOGNIN, p. clv, Bull. Soc. Ent. Fr. 1891, n. sp.

✓ *Brachartona*, n. g., near *Artona*, for *B. purpurascens*, n. sp., S. India ; HAMPSON, Ill. Lep. Het. viii, p. 44, pl. cxxxix, fig. 4.

*Clelia discriminis*, Khasia Hills, SWINHÖE, p. 474, Tr. E. Soc. 1891, n. sp.

*Eucereon appunctata*, *nigrescens*, Loja, DOGNIN, p. clxxv, Bull. Soc. Ent. Fr. 1891, n. spp.

*Euchromia africana*, larva noticed ; MONTEIRO, (598) p. 205.

*Eupyra sarama*, Venezuela, DOGNIN, Le Nat. 1891, p. 109, n. sp.

*Gnophala clappiana*, Colorado, HOLLAND, p. 156, Ent. News, ii, n. sp.

*Hydrusa era*, pl. xix, fig. 15, *baiea*, fig. 10, p. 473, *actea*, fig. 7, p. 474, Khasia Hills, SWINHOE, Tr. E. Soc. 1891, n. spp.

*Odozana fifi*, *O. ? anitras*, Loja, DOGNIN, p. 126, Le Nat. 1891, n. spp.

*Oeta compta* n. var. *floridana* ; NEUMOEGEN, p. 122, Canad. Ent. xxiii.

*Phacusa mathona*, Loja, DOGNIN, Le Nat. 1891, p. 125, n. sp.

*Syntomis ganssuensis*, Central Asia, GROOM-GRSHIMAÏLO, p. 461, Hor. Ent. Ross. xxv ; *S. magna*, p. 133, pl. viii, fig. 1, *mota*, fig. 2, *lydia*, fig. 7, p. 134, S. India, SWINHOE, Tr. E. Soc. 1891 ; *S. gelatina*, S. India, HAMPSON, Ill. Lep. Het. viii, p. 43, pl. cxxxix, fig. 1 : n. spp.

*Tascia gana*, S. India, SWINHOE, p. 133, pl. viii, fig. 12, Tr. E. Soc. 1891, n. sp.

*Thyrassia aurodisca*, S. India, HAMPSON, Ill. Lep. Het. viii, p. 44, pl. cxxxix, fig. 10, n. sp.

<sup>1</sup>*Tricholepis*, n. g., for *T. erubescens*, n. sp., S. India, HAMPSON, Ill. Lep. Het. viii, p. 44, pl. cxxxix, figs. 3 & 12.

*Zygæna loniceræ* and *filipendulæ*, hybrids between ; FLETCHER, p. ix, Tr. E. Soc. 1891. *Z. filipendulæ*, variation noticed ; SOUTH, Ent. xxiv, p. 233. *Z. angelicæ* n. var. *doleschalli* ; RÜHL, Soc. Ent. vi, p. 105.

#### ARCTIIDÆ.

[*Cf.* DOGNIN (191, 192), GROOM-GRSHIMAÏLO (355), GUNDLACH (361), HAMPSON (369), MABILLE (552), NEUMOEGEN (615), ROGENHOFER (747), STAUDINGER (841), SWINHOE (851).]

*Alpenus eximia*, S. India, SWINHOE, p. 137, pl. viii, fig. 8, Tr. E. Soc. 1891, n. sp.

*Aloa collaris*, S. India, HAMPSON, Ill. Lep. Het. viii, p. 54, pl. cxl, fig. 18, n. sp.

*Antarctia beanii*, N. W. America, NEUMOEGEN, p. 123, Canad. Ent. xxiii, n. sp.

*Arctia cervini*, habitat ; RIESEN, S. E. Z. 1891, p. 13, and WACKERZAPP, t. c. p. 258. *A. rectilinea*, preparatory stages ; FRENCH, Canad. Ent. xxiii, p. 130. *A. arizonensis*, notes on larva of ; BRUCE, t. c. p. 114.

*A. romanovi, sieversi*, Central Asia, GROOM-GRSHIMAÏLO, p. 462, Hor. Ent. Ross. xxv ; *A. fortunata*, Canary Is., STAUDINGER, p. 159, Deutsche e. Z. Lep. iv : n. spp.

*Callimorpha incomparabilis*, Guinea, MABILLE, p. clxxiv, Bull. Soc. Ent. Fr. 1891, n. sp.

*Ecpantheria scribonia* : notes on life-history ; DYAR, Canad. Ent. xxiii, p. 106.

*E. hebona*, Loja, DOGNIN, Le Nat. 1891, p. 125, n. sp.

*Empusa daga*, Zumba (? Ecuador), DOGNIN, Le Nat. 1891, p. 125, n. sp.

<sup>1</sup>*Gaujonia*, n. g., near *Halisidota* and *Phægoptera*, p. 125, for *G. arbori*, n. sp., Loja, p. 126, DOGNIN, Le Nat. 1891.

*Halisidota*: the larvæ of New York species described ; *H. harrissii*, specific characters of ; DYAR, Psyche, vi, pp. 162-166. *H. caryæ*, metamorphoses ; SOULE, Psyche, vi, p. 158. *H. specularis*, H.-Sch., = (*trigona*, Grt.) ; DYAR, p. 43, Canad. Ent. xxiii, but *cf.* GROTE, t. c. p. 109, and SMITH, t. c. p. 158.

*H. falacra*, Ecuador, DOGNIN, p. clxxv, Bull. Soc. Ent. Fr. 1891, n. sp.  
*Nemeophila plantaginis*, n. var. *sifanica*; GROUM-GRSHIMAÏLO, p. 462, Hor. Ent. Ross. xxv.

*Phæoptera minerva*, *ergana*, *medica*, Loja, DOGNIN, p. 242, Le Nat. 1891, n. spp.

*Phragmatobia assimilans* figured, with n. var. *franconia*; SLOSSON, Ent. News, ii, p. 41, pl. iii. *P. fuliginosa*, L., = (*rubricosa*, Har.) ; DYAR, p. 40, Canad. Ent. xxiii.

*Phragmatobia* ? *fumipennis*, S. India, HAMPSON, Ill. Lep. Het. viii, p. 54, pl. cxl, fig. 24, n. sp.

*Pseudapistosia umber*, Cr., = (*Opharus gigas*, Dogn.) ; DOGNIN, p. 51, Lep. Loja.

*P. ? rema*, Brazil, DOGNIN, p. clxxvi, Bull. Soc. Ent. Fr. 1891, n. sp.

*Purius courregesi*, Loja, DOGNIN, Le Nat. 1891, p. 257, n. sp.

*Robinsonia dewitzi*, Cuba, GUNDLACH, Ent. Cubana, p. 265, n. sp. ?

*Spilosoma mendica*, metamorphoses described and figured ; SEPP, Nederl. Ins. (2) iv, pp. 242-252, pl. xlii. *D. mendica*, ♂ Irish var ; BARRETT, Ent. M. M. (2) ii, p. 303. *S. sordida*, larva noticed ; BAKER, t. c. p. 303. *S. latipennis*, preparatory stages ; DYAR, Ent. News, ii, p. 115. *S. obliqua*, egg described ; EDWARDS, Vict. Nat. vii, p. 24.

*S. alticola*, Kilima-njaro, ROGENHOFER, p. 464, Ann. Hofmuseum Wien, vi, n. sp.

✓*Spilarctia*, n. subg. of *Arctia*, p. 162, for *A. (S.) semiramis*, Asia Minor, p. 161 ; STAUDINGER, Deutsche e. Z. Lep. iv.

*S. bifascia*, S. India, HAMPSON, Ill. Lep. Het. viii, p. 55, pl. cxl, fig. 21, n. sp.

*Theages merula*, Loja, DOGNIN, Le Nat. 1891, p. 278, n. sp.

#### PERICOPIDÆ, MELAMERIDÆ, DIOPTIDÆ.

*Euagra cærulea* (sic), Loja, DOGNIN, Le Nat. 1891, p. 125, n. sp.

*Hyalurga noguei*, Loja, DOGNIN, Le Nat. 1891, p. 242, n. sp.

*Pyromorpha dimidiata*, egg, and young larva described ; BEUTEN-MULLER, Ent. News, ii, p. 152.

#### LITHOSIIDÆ.

[Cf. DOGNIN (192), HAMPSON (369), HEYLAERTS (390), ROGENHOFER (747), SWINHOE (851, 852).]

*Æmene nilgirica*, fig. 1, *cinereicolor*, fig. 8, p. 51, *quinfascia*, fig. 15, p. 52, pl. cxl, S. India, HAMPSON, Ill. Lep. Het. viii ; *Æ. tau*, Java, HEYLAERTS, p. cccxiv, C.R. Ent. Belg. xxxv : n. spp.

✓*Costarcha*, n. g., for *C. indistincta*, n. sp., S. India, pl. cxl, fig. 22 ; HAMPSON, p. 53, Ill. Lep. Het. viii.

*Barsine chromatica*, S. India, SWINHOE, p. 135, Tr. E. Soc. 1891 ; *B. delicia*, Khasia Hills, SWINHOE, p. 477, pl. xix, fig. 12, t. c. : n. spp.

*Bizone peregrina* and *puella*, characters and synonymy noticed ; SWINHOE, p. 136, Tr. E. Soc. 1891.

- B. linatula*, S. India, SWINHOE, p. 135, Tr. E. Soc. 1891, n. sp.  
*Cratosia unilineata*, Ecuador, DOGNIN, Le Nat. 1891, p. 8, n. sp.  
*Diduga fulvicosta*, fig. 16, p. 52, *albicosta*, fig. 17, p. 53, pl. cxi, S. India, HAMPSON, Ill. Lep. Het. viii, n. spp.  
*Digama marchalii* n. var. *intermedia* ; HAMPSON, p. 47, Ill. Lep. Het. viii.  
*Eudule cinctata*, Loja, DOGNIN, Le Nat. 1891, p. 126, n. sp.  
<sup>↓</sup>*Gnophrioides*, n. g., near *Gnophria*, for *G. flaviplaga*, n. sp., Java ; HEYLAERTS, p. ccccxii, C.R. Ent. Belg. xxxv.  
*Hypocrita septemmaculata*, Java, HEYLAERTS, p. ccccxiii, C.R. Ent. Belg. xxxv, n. sp.  
*Katha brevipennis*, Walk., figured, and ♂ described ; HAMPSON, Ill. Lep. Het. viii, p. 47, pl. cxxxix, figs. 2 & 11.  
*Lithosia rubriceps*, Trop. Africa, ROGENHOFER, p. 463, pl. xv, fig. 11, Ann. Hofmuseum Wien, vi ; *L. (Chrysorhabdia) gigas*, p. cccci, *L. (Dolgoma) undulata*, p. ccccx, *L. (Bitecta) murina*, *L. (Feulisna) semi brunnea*, p. ccccx, Java, HEYLAERTS, C.R. Ent. Belg. xxxv : n. spp.  
*Lyclene curvifascia*, fig. 17, *suffusa*, fig. 18, p. 49, *fuscalis*, fig. 9, *rosea*, fig. 19, *aurora*, fig. 20, p. 50, *ochracea*, fig. 26, *obliqua*, fig. 25, p. 51, S. India, HAMPSON, pl. cxxxix, Ill. Lep. Het. viii ; *L. scripta*, Sumatra, *semicirculata*, ni, Java, HEYLAERTS, p. ccccxv, C.R. Ent. Belg. xxxv : n. spp.  
*Mieza galactina*, Maas., validity and generic position queried ; SNELLEN, p. 187, Tijdschr. Ent. xxxiv.  
*Nola* : thoracic glands in various larvæ of ; PACKARD, pp. 94-96, P. Bost. Soc. xxv. *N. ovilla*, *trinitota*, *hyemalis*, *sorghielli*, larvæ described ; DYAR, Psyche, vi, p. 110. *N. lugens*, metamorphoses ; EDWARDS, Vict. Nat. vii, p. 24.  
*N. major*, fig. 13, *minuta*, fig. 14, *nigrifascia*, fig. 15, S. India, HAMPSON, p. 48, pl. cxxxix, Ill. Lep. Het. viii, n. spp.  
<sup>↓</sup>*Notata*, n. g., p. 47, for *N. parva*, n. sp., S. India, p. 48, pl. cxxxix, fig. 5, HAMPSON, Ill. Lep. Het. viii.  
*Padenia basipuncta*, S. India, HAMPSON, Ill. Lep. Het. p. 49, pl. cxxxix, fig. 8, n. sp.  
*Paidia fumipennis*, S. India, HAMPSON, p. 52, pl. cxi, fig. 7, Ill. Lep. Het. viii ; *P. bipunctata*, Java, HEYLAERTS, p. ccccxiv, C.R. Ent. Belg. xxxv : n. spp.  
*Raeselia culaca*, Nilgiri Hills, SWINHOE, p. 137, pl. viii, fig. 9, Tr. E. Soc. 1891, n. sp.  
<sup>↓</sup>*Schistophleps*, n. g., near *Homopsyche*, p. 53, for *S. bipuncta*, n. sp., S. India, p. 54, pl. cxi, fig. 23 ; HAMPSON, Ill. Lep. Het. viii.

#### NYCTEMERIDÆ, NYCTEOLIDÆ, EUSCHEMIDÆ.

[Cf. DRUCE (337), HAMPSON (369, 370), SHARPE (809), SWINHOE (851, 852).]

*Deilemema carissima*, Khasia Hills, SWINHOE, p. 477, pl. xix, fig. 1, Tr. E. Soc. 1891, n. sp.



*Earias luteolaria*, S. India, HAMPSON, Ill. Lep. Het. viii, p. 46, pl. cxxxix, fig. 16, n. sp.

*Euschema nelera*, p. 141, *percota*, p. 142, SWINHOE, Tr. E. Soc. 1891, n. spp.

*Girpa wardi*, Congo, SHARPE, p. 133, Ann. N. H. (6) vii, n. sp.

*Otroeda jonesi*, Gaboon, SHARPE, p. 134, Ann. N. H. (6) vii, n. sp.

*Paracrama rectomarginata*, S. India, HAMPSON, Ill. Lep. Het. viii, p. 46, n. sp.

*Phæochlena solilucis*, figured, pl. xli, figs. 9 & 10; Biol. Centr. Am. Heter. ii.

*P. cytheris*, Central America, DRUCE, p. 2, pl. xli, fig. 11, Biol. Centr. Am. Heter. ii, n. sp.

*Secusio parvipuncta*, India and Africa, HAMPSON, Ill. Lep. Het. viii, p. 46, pl. cxxxix, fig. 6, n. sp.

*Simena luctifera*, Wlk., = (*Melandia æquinotialis*, Gn.), p. 2: the species figured, pl. xli, fig. 12; DRUCE, Biol. Centr. Am. Heter. ii.

*Terina fulva*, E. Africa, HAMPSON, p. 183, Ann. N. H. (6) vii, n. sp.

#### LIPARIDÆ.

[Cf. DOGNIN (192), GROUM-GRSHIMAILO (355), HAMPSON (369), MEYRICK (582), ROGENHOFER (747), SWINHOE (851, 852), WACHTL (911).]

Eversible glands in larvæ of various genera noticed; PACKARD, pp. 89 & 90, P. Bost. Soc. xxv.

*Aroa incerta*, Trop. Africa, ROGENHOFER, p. 464, Ann. Hofmuseum Wien, vi; *A. sienna*, S. India, HAMPSON, Ill. Lep. Het. viii, p. 55, pl. cxl, figs. 2 & 9: n. spp.

*Artaxa pelona, rhoda*, S. India, SWINHOE, p. 138, Tr. E. Soc. 1891; *A. subfuscula*, figs. 5 & 11, *variegata*, fig. 6, p. 56, *obsoleta*, fig. 12, pl. cxl, *luteifascia*, pl. cxli, fig. 2, p. 57, HAMPSON, Ill. Lep. Het. viii: n. spp.

*Asthenia*, Westw., note on the viability of the name; SNELEN, p. 190, Tijdschr. Ent. xxxiv.

*Charnidas colon*, figs. 3 & 19, *pallida*, fig. 10, pl. cxl, S. India, HAMPSON, p. 56, Ill. Lep. Het. viii, n. spp.

*Darala xantharca, protocentra*, p. 191, *asterias*, p. 192, S. Australia, MEYRICK, Tr. R. Soc. S. Austr. xiv, n. spp.

*Dasychira lintneri*, Grt., referred to *Gluphisia*; DYAR, p. 159, Canad. Ent. xxiii. *D. pudibunda* var. *concolor*, notes on; JUNGE, Verh. Ver. Hamb. vii, pp. 41-44.

*D. fortunata*, Canary Is., ROGENHOFER, p. 566, Verh. z.-b. Wien, xli; *D. nilgirica*, S. India, HAMPSON, p. 58, pl. cxli, figs. 13 & 14, Ill. Lep. Het. viii; *D. (Dasorgyia) semenovi, alpherakii*, Central Asia, GROUM-GRSHIMAILO, Hor. Ent. Ross. xxv, p. 464: n. spp.

*E. bifascia*, S. India, HAMPSON, p. 58, pl. cxli, fig. 8, Ill. Lep. Het. viii; *E. illanta*, S. India, SWINHOE, p. 138, Tr. E. Soc. 1891: n. spp.

*Hypsoides*, Butl., = (*Cenostegia*, Mabille); KIRBY, Ent. M. M. (2) ii, p. 129.

*Laelia uniformis*, S. India, HAMPSON, p. 56, pl. cxi, figs. 4 & 20, Ill. Lep. Het. viii; *L. eremaea*, Queensland, MEYRICK, p. 193, Tr. R. Soc. S. Austr. xiv : n. spp.

*Liparis sulicis*, metamorphoses; PISSOT, Le Nat. 1891, p. 89.

*Lymantria todura*, Moore, ♀ described and figured; HAMPSON, p. 59, pl. cxli, fig. 15, Ill. Lep. Het. viii.

*Murdara feminula*, S. India, HAMPSON, p. 58, pl. cxli, figs. 1 & 7, Ill. Lep. Het. viii, n. sp.

*Ocneria heliaspis*, New South Wales, MEYRICK, p. 192, Tr. R. Soc. S. Austr. xiv, n. sp.

*Orgyia antiqua* and *hova* are one species; RILEY, Canad. Ent. xxiii, p. 232. *O. definita*, stages of larva described; DYAR, Psyche, vi, p. 111 : and larva described; *id.* Ins. Life, iii, p. 390.

*O. confinis*, Central Asia, GROUM-GRSHIMAILO, p. 463, Hor. Ent. Ross. xxv; *O. interjecta*, Khasia Hills, SWINHOE, p. 478, pl. xix, fig. 2, Tr. E. Soc. 1891 : n. spp.

*Porthesia nyctea*, Central Asia, GROUM-GRSHIMAILO, p. 464, Hor. Ent. Ross. xxv; *P. anacausta*, Tasmania, *hololeuca*, S. and W. Australia, p. 193, *iobrota*, *pyraustis*, Queensland, p. 194, MEYRICK, Tr. R. Soc. S. Austr. xiv : n. spp.

*Psilura monacha*, natural history, metamorphoses, larvæ, and varieties of imago figured; WACHTL, Wien. ent. Z. x, pp. 149-180; pls. i & ii.

*Redoa nigricilia*, *dica*, Khasia Hills, SWINHOE, p. 478, Tr. E. Soc. 1891, n. spp.

*Somena magna*, Khasia Hills, SWINHOE, p. 479, Tr. E. Soc. 1891; *S. bipunctapez*, E. Asia, fig. 13, *sagroides*, S. India, fig. 14, HAMPSON, p. 57, p. 140, Ill. Lep. Het. viii : n. spp.

*Teara tessellata*, pupa described; EDWARDS, Vict. Nat. vii, p. 24.

*Xenosoma flavisedes*, Venezuela, DOGNIN, Le Nat. 1891, p. 121, n. sp.

## PSYCHIDÆ.

[Cf. COTES (162), HAMPSON (369), HEYLAERTS (389), MOORE (601).]

*Babula grotei*, Calcutta, MOORE, Ind. Mus. Notes, ii, p. 12, n. sp.

*Eumeta sikkima*, E. India, MOORE, p. 67, Ind. Mus. Notes, ii, n. sp.

↓ *Eurukuttarus*, n. g., for *E. pileatus*, n. sp., S. India, pl. cxliv, fig. 13; HAMPSON, p. 66, Ill. Lep. Het. viii.

*Fumea trimenii*, Delagoa Bay, HEYLAERTS, p. cccclxxiv, C.R. Ent. Belg. xxv, n. sp.

*Oiketicus hübnéri* : habits and metamorphoses; OLLIFF, Agric. Gaz. N.S.W. iii, pp. 349-351, pl. xxxiii. *A. saundersi* : larva described; EDWARDS, Vict. Nat. vii, p. 26.

*Psyche villosella* : notes on life-history; WEIR, Ent. xxiv, p. 226.

*Thyridopteryx herrichii*, larva described; EDWARDS, Vict. Nat. vii, p. 25.

## NOTODONTIDÆ.

[*Cf.* DOGNIN (196), HAMPSON (369), HEYLAERTS (390), HUDSON (421, 422), NEUMOEGEN (615), POUJADE (663), SWINHOE (851, 852), WASSILIEFF (936).]

*Apatelodes torrefacta*, larval stages; DYAR, *Psyche*, vi, p. 146.

*Calpe*, n. sp., *cf.* *Noctuidæ*.

*Carea purpurea*, S. India, HAMPSON, p. 59, pl. cxli, figs. 4 & 9, Ill. Lep. Het. viii; *C. rectilinea*, Borneo, HEYLAERTS, p. ccccxvi, C.R. Ent. Belg. xxxv : n. spp.

*Ceira pallida*, Java, HEYLAERTS, p. ccccxvi, C.R. Ent. Belg. xxxv, n. sp.

*Cerura cinerea*, Wlk. : larvæ of Eastern and Western forms described; DYAR, *Psyche*, vi, pp. 80–83. *C. scolopendrina*, Boisd., = (*aquilonaris*, Lint.); *id.* Canad. Ent. xxiii, p. 186. *C. borealis*, preparatory stages; *id.* p. 83, t. c.

*C. modesta*, New York, HUDSON, p. 197, Canad. Ent. xxiii, n. sp.

*Datana perspicua*, preparatory stages; DYAR, p. 82, Canad. Ent. xxiii.

*Gluphisia trilineata* : larva and pupa described; DYAR, *Psyche*, vi, p. 146.

*G. avimacula*, N. America, HUDSON, Ent. News, ii, p. 155, n. sp.

*Harpyia wisei*, S. India, SWINHOE, p. 139, pl. viii, fig. 3, Tr. E. Soc. 1891, n. sp.

*Heterocampa unicolor*, preparatory stages; DYAR, *Psyche*, vi, p. 95.

*H. guttivitta*, larva described; DYAR, *Psyche*, vi, p. 178.

*H. nivea*, Utah, NEUMOEGEN, p. 124, Canad. Ent. xxiii; *H. mariva*, Venezuela, DOGNIN, Le Nat. 1891, p. 109 : n. spp.

*Icthyura undulata*, fig. 3, *submarginalis*, fig. 5, S. India, HAMPSON, pl. cxli, p. 60, Ill. Lep. Het. viii, n. spp.

*Inguira cornucopia*, S. India, HAMPSON, p. 61, pl. cxli, fig. 12, Ill. Lep. Het. viii, n. sp.

*Nadata gibbosa*, early stages; SOULE, *Psyche*, vi, p. 197.

*Oedemasia eximia* referred to *Schizura*, *Æ. salicis*, larva described; DYAR, p. 177, *Psyche*, vi.

*Pheosia dimidiata*, preparatory stages; DYAR, *Psyche*, vi, pp. 194–196.

*Pydna notata*, Khasia Hills, SWINHOE, p. 479, pl. xix, fig. 16, Tr. E. Soc. 1891, n. sp.

*Rhegmatoiphila alpina*, Bell., metamorphoses; POUJADE, pp. 593–596, pl. xvi, Ann. Soc. Ent. Fr. 1891.

*Stauropus griseus*, fig. 16, p. 59, *dentilinea*, fig. 10, p. 60, S. India, HAMPSON, Ill. Lep. Het. viii, n. spp.

## LIMACODIDÆ, DREPANULIDÆ.

[*Cf.* DOGNIN (192), DYAR (224, 225, 226), HAMPSON (369), MEYRICK (582).]

*Ciliz olivacea*, S. India, HAMPSON, p. 63, pl. cxlii, fig. 9, Ill. Lep. Het. viii, n. sp.

*Decetia lunuliferata*, Wlk., referred to *Somatina*, and figured, pl. cxlii, figs. 1 & 5; HAMPSON, p. 62, Ill. Lep. Het. viii.

*Drepana cultraria*, forma minor discussed; FUCHS, pp. 222-229, JB. nass. Ver. xlv.

*Dryopteris rosæ*, larva described; DYAR, Psyche, vi, p. 179.

*Euclea nana*, N. America, DYAR, Ent. News, ii, p. 61, pl. iv, fig. 5; *E. ? yamouna*, Loja, DOGNIN, p. 126, Le Nat. 1891 : n. spp.

*Isa* : note on its composition and synonymy; DYAR, Ent. News, ii, p. 156.

*Limacodes*; scent-glands in larva of; PATTON, Canad. Ent. xxiii, p. 42.

*L. grisea*, S. India, HAMPSON, p. 63, pl. cxlii, fig. 7, Ill. Lep. Het. viii, n. sp.

*Momopola*, n. g., for *M. miltogramma*, n. sp., Queensland; MEYRICK, p. 190, Tr. R. Soc. S. Austr. xiv.

*Monoleuca subdentosa*, N. America, DYAR, Ent. News, p. 62, pl. iv, fig. 21, n. sp.

*Narosa contaminata*, S. India, HAMPSON, p. 63, pl. cxlii, fig. 3, Ill. Lep. Het. viii, n. sp.

*Natada nilgirica*, S. India, HAMPSON, p. 63, pl. cxlii, fig. 13, Ill. Lep. Het. viii, n. sp.

*Oreta rotundipex*, fig. 6, p. 61, *castanea*, fig. 7, *violacea*, fig. 18, p. 62, pl. cxli, S. India, HAMPSON, Ill. Lep. Het. viii, n. spp.

*Packardia* : the number of species is only two, *elegans* and *geminata*; DYAR, p. 276, Canad. Ent. xxiii.

*Parasa chloris*, food-plants; KUNZE, Ent. News, ii, p. 208.

*Tortricidia flavula*, larva described; DYAR, Psyche, vi, p. 145.

#### SATURNIIDÆ, ENDROMIDÆ, BOMBYCIDÆ, LASIOCAMPIDÆ.

[*Cf.* COTES (163), DOGNIN (190, 192, 193), HAMPSON (369, 370), MEYRICK (582), ROGENHOFER (747), SOULE (833), SWINHOE (851).]

Notes and figures of the silk-producing *Saturniidæ* of E. India; COTES, Ind. Mus. Notes, ii, pp. 69-85; also of the silk-producing *Bombycidæ*, pp. 85-89.

Suggestions as to the origin of the "caudal spine" in the *Attacidæ*; PACKARD, pp. 99-105, P. Bost. Soc. xxv.

*Anisota rubicunda*, metamorphoses described, p. 253, figured, pl. v, fig. 3; RILEY, Rep. 1890.

*Antherea eucalypti*, young larva described; EDWARDS, Vict. Nat. vii, p. 24. *A. astrophela*, Wlk., ♂ ♀ figured and noticed, pl. xiii, p. 11; SCOTT, Australian Lep. ii.

*A. (Thyella) hoecknelii*, Kilima-njaro, ROGENHOFER, p. 464, Ann. Hof-museum Wien, vi, n. sp.

*Apona plumosa*, ♀ figured, pl. cxlii, fig. 12, Ill. Lep. Het. viii.

*Bombyx miroleuca*, S. Australia, MEYRICK, p. 190, Tr. R. Soc. S. Austr. xiv, n. sp.

*Callosamia promethea*, preparatory stages; BEUTENMULLER, Psyche, vi, p. 94.

- Citheronia regalis* n. var. *saengeri*; NEUMOEGEN, Ent. News, ii, p. 151.
- Eacles imperialis* n. var. *punctatissima*, *nobilis*; NEUMOEGEN, Ent. News, ii, p. 150.
- E. eminens*, LOJA, DOGNIN, Le Nat. 1891, p. 36, n. sp.
- Endromis versicolora*, larval habits; POULTON, P. E. Soc. 1891, p. xv.
- Eriogaster lanestris*, composition of cocoon; POULTON, P. E. Soc. 1891, p. xv; colour of cocoon, BATESON (42).
- Eupterote hirsuta*, S. India, SWINHÖE, p. 139, Tr. E. Soc. 1891; *E. flavia*, fig. 10, *rufolisca*, fig. 11, p. 64, *rectifascia*, fig. 4, *unicolor*, fig. 8, p. 65, pl. cxlii, HAMPSON, Ill. Lep. Het. viii, n. spp.
- Gasina perseæ*, LOJA, DOGNIN, Le Nat. 1891, p. 62, n. sp.
- Gastropacha franconica*, habits; BRAUNS, Ent. Nachr. xvii, p. 110.
- G. ægroba*, KL., = (*Brachysoma codeti*, Aust.); OERTHUR, p. clxi, Bull. Soc. Ent. Fr. 1891, and CHRÉTIEN, t. c. p. clxxii.
- Hemileucini*: lateral eversible abdominal glands in; PACKARD, pp. 90–94, P. Bost. Soc. xxv.
- Henucha dentata*, E. Africa, HAMPSON, p. 184, Ann. N. H. (6) vii, n. sp.
- Heteropacha rileyana*, early stages; FRENCH, Psyche, vi, p. 30: metamorphoses; SOULE, Psyche, vi, p. 193.
- Hydrias globulus*, Ecuador, DOGNIN, Le Nat. 1891, p. 278; *H. ocyroe*, Ecuador, DOGNIN, p. clv, Bull. Soc. Ent. Fr. 1891: n. spp.
- Hyperchiria io*, mode of marching of larva; SOULE, Psyche, vi, p. 15.
- Lasiocampa ilicifolia* n. var. *sinina*; GROOM-GRSHIMAÏLO, p. 465, Hor. Ent. Ross. xxv.
- Lenodora fasciata*, ♂ figured, pl. cxlii, fig. 6, Ill. Lep. Het. viii.
- Macromphalia lojanensis*, Ecuador, DOGNIN, Le Nat. 1891, p. 126, n. sp.
- Messata acinia*, S. India, SWINHÖE, p. 141, Tr. E. Soc. 1891, n. sp.
- Nisaga teta*, S. India, SWINHÖE, p. 140, Tr. E. Soc. 1891, n. sp.
- Opsirhina fervens*, metamorphoses; EDWARDS, Vict. Nat. vii, p. 25.
- Platysamia gloveri* n. var. *reducta*; NEUMOEGEN, Ent. News, ii, p. 152.
- Prismoptera trossula*, LOJA, DOGNIN, p. 126, Le Nat. 1891, n. sp.
- Pseudohazis eglanterina* var. *denudata*, p. 145, *hera*, n. var. *marcata*, p. 146, described; NEUMOEGEN, Canad. Ent. p. 146.
- Radhica rosea*, S. India, HAMPSON, p. 65, pl. cxliv, fig. 18, Ill. Lep. Het. viii, n. sp.
- Saturnia marnois*, E. Africa, ROGENHOFER, p. 565, Verh. z.-b. Wien, xli, n. sp.
- Spalyria adolpheï*, Guer., figured, pl. cxlii, fig. 2, Ill. Lep. Het. viii.

## ZEUZERIDÆ, HEPIALIDÆ.

[Cf. DOGNIN (196), GROOM-GRSHIMAÏLO (355), HAMPSON (369), TEPPER (854).]

*Brachylia stigmata*, S. India, HAMPSON, p. 66, pl. cxliv, fig. 1, Ill. Lep. Het. viii, n. sp.

*Cossula*, Bailey, = (*Inguromorpha*, H. Edw.; *C. (sub Cossus) basalis*, Wlk., = (*Cossula magnifica*, Bailey, and *I. slossonii*, Edw.); EDWARDS, Ent. News, ii, p. 72.

*Cossus edwardsi*, Adelaide, TEPPER, p. 63, pl. i, Tr. R. Soc. S. Austr. xiv.

*C. lucifer*, Central Asia, GROUM-GRSHIMAÏLO, p. 463, Hor. Ent. Ross. xxv, n. sp.

*Hepialus*, pairing in ; ROBSON, Ent. M. M. (2) ii, p. 197.

*H. luteus*, Central Asia, GROUM-GRSHIMAÏLO, p. 463, Hor. Ent. Ross. xxv, n. sp.

*Langsdorfia minima*, *malina*, Loja, DOGNIN, p. 257, Le Nat. 1891, n. spp.

*Phragmataecia minima*, pl. cxliv, fig. 14, *impura*, fig. 7, S. India, HAMPSON, p. 66, Ill. Lep. Het. viii, n. spp.

*Prionoxystus querciperda*, sexes figured ; LUGGER, Psyche, vi, pl. iii.

*Zeuzera lelex*, Venezuela, DOGNIN, Le Nat. 1891, p. 121, n. sp.

#### CYMATOPHORIDÆ.

[Cf. BUCKLER (109), BUTLER (116), DOGNIN (192).]

*Asphalia oniroe*, Loja, DOGNIN, p. 126, Le Nat. 1891, n. sp.

*Cusandria* (sub *Laphygma*) *filifera*, Wlk., ♀ = (*L. ferrocana* and *nigriscripta*, Wlk.) ; BUTLER, Ent. xxiv, p. 238.

*Cosmodes*, *Oanna*, and *Jaspidea*, referred to *Cymatophoridæ* ; BUTLER, Ent. xxiv, p. 238.

#### NOCTUIDÆ.

[Cf. BAKER (27), BUCKLER (109), BUTLER (116, 118, 120), CALBERLA (126), DOGNIN (195), GROTE (352), HAMPSON (369), JOANNIS (443), MABILLE (550), MALLY (559), MEYRICK (582), NEUMOEGEN (615), RÜHL (758), SAALMÜLLER (759), SMITH (821-825), SOUTH (835), STAUDINGER (839), SWINHÖE (851, 852), TUTT (884).]

Sepp's views as to the mode of walking of young caterpillars of *Noctuidæ* ; CHRÉTIEN, Le Nat. 1891, pp. 19 & 20.

Comparison of European and N. American *Noctuidæ*-faunæ ; GROTE (352).

Figures and descriptions of the larvæ of British *Noctuidæ* ; BUCKLER, Ray Soc. 1890.

Descriptions of varieties of many species of British *Noctuidæ* ; TUTT (884).

*Biregula*, n. g., without characters (? *Deltoidoidæ* or *Noctuidæ*), for *B. recens*, n. sp., Madagascar, p. 491, fig. 150 ; SAALMÜLLER, Lep. Madag.

*Acontia stumpffi*, p. 331, *luteola*, p. 333, fig. 171, *navulosa*, p. 334, fig. 237, *trimacula*, p. 335, Nossi-Bé, SAALMÜLLER, Lep. Madag. ; *A. brunea*, pl. cxlv, fig. 11, *trigona*, fig. 4, *umbrina*, fig. 15, p. 74, *fuscicilia*, fig. 17, *laminata*, fig. 5, *ruptifuscia*, fig. 12, p. 75, S. India, HAMPSON, Ill. Lep. Het. v.ii : n. spp.

*Acronycta*, note on the division of, to the effect that *Pharetra*, Hb., = (*Viminia*, Chap.), *Triana*, Hb., = (*Cuspidia*, Chap.), *Arctomyscis*, Hb., =

(*Bisulcia*, Chap.); BUTLER, Ent. xxiv, p. 111. *A. (Cuspidia) alni*, life history; CHAPMAN, Ent. Rec. ii, pp. 121-131. *A. (Cuspidia) psi*, *tridens*, *leporina*, *aceris*, *megeocephala*, *alni*, *strigosa*, *A. (Bisulcia) ligustri*, eggs figured, pl. viii, noticed, pp. 75-77; *id. t. c. A.*: details of pupæ figured; *id. t. c. pl. iii. A. (Cuspidia) strigosa*, life history; *id. t. c.* pp. 241-251 (*cf. also Viminia*). *A. strigosa* n. var. *bryophiloides*; HORMUZAKI, Ent. Nachr. xvii, p. 145. *A. alni*, young larva noticed; PRIDEAUX, Ent. xxiv, p. 267: pupation; JEFFREYS, l. c. *A. euphorbiæ* var. *obscura*, Ström., synonymical and biological note; SANDBERG, Förh. Selsk. Chr. 1890, No. 8, pp. 1-7.

*Adisura*, sub *Leucania moribunda*, Gn., = (*invaria*, Wlk.); BUTLER, Ent. xxiv, p. 294.

*Agarista*, n. sp., *cf. Agaristidæ*.

*Agrotiphila staudingeri*, Moesch., = (*montana*, Morr.); SMITH, p. 133, Tr. Am. Ent. Soc. xviii.

*A. colorado*, p. 133, *rigida*, p. 134, Colorado, SMITH, Tr. Am. Ent. Soc. xviii, n. spp.

*Agrotis*: notes on the male characters and on some synonymy; GROTE, pp. 147-152, Canad. Ent. xxiii. Remarks on Smith's revision; *id. t. c.* pp. 45-48, and SMITH, *t. c.* pp. 90 & 91. *A. reticens*, Wlk., *ordinata*, Wlk., *indirecta*, Wlk., are *Carneades messoria*; SMITH, p. 120, *t. c. A. splendens*, Druce, = (*Magusa apicimacula*, Maas.); SNELLEN, p. 191, Tijdschr. Ent. xxxiv. *A. subgothica*, synonymical note; WEIR, Ent. xxiv, p. 50. *A. subgothica*, Haw., note on; GROTE, p. 202, Canad. Ent. xxiii. *A. pyrophila*, larva described; REID, Ent. Rec. i, p. 337.

*A. huguenini*, Switzerland, RÜHL, p. 42, Soc. Ent. vi; *A. abdita*, Asia Minor, JOANNIS, p. lxxxi, Bull. Soc. Ent. Fr. 1891; *A. conflua*, Madagascar, SAALMÜLLER, p. 286, Lep. Madag.: n. spp.

*Agryphia*, n. g., near *Anomis*, for *A. modesta*, p. 411, fig. 183, *torrida*, p. 412, fig. 185, *pulverulenta*, p. 413, n. spp., Madagascar; SAALMÜLLER, Lep. Madag.

*Alamis albangua*, figured, fig. 223, redescribed, p. 417, *lituraria*, p. 419, fig. 183; SAALMÜLLER, Lep. Madag.

*A. nigrocollaris*, Madagascar, SAALMÜLLER, p. 490, fig. 149, Lep. Madag.: *A. yendola*, S. India, SWINHOE, p. 150, Tr. E. Soc. 1891: n. spp.

*Amathes phyllophora* = (*Mythimna subporphyrea*, Wlk.); BUTLER, Ent. xxiv, p. 238. *A. xanthographa* = (*Orthosia guttilinea*, Wlk.), and *A. rubi* = (*Caradrina posticata*, Wlk.); *id. t. c.* p. 239.

*Anarta*, sub *Hadena richardsoni*, Curt., = (*septentrionis*, Wlk.); *A. quieta*, Hb., = (*constricta* and *rigida*, Wlk.); BUTLER, Ent. xxiv, p. 293.

*Anchiroe*, n. g., for *Erastria blandula*, Gn., and *A. flavofimbria*, n. sp., Madagascar, p. 231; SAALMÜLLER, p. 350, Lep. Madag.

*Anomis olivacea*, Madagascar, SAALMÜLLER, p. 408, Lep. Madag., n. sp.

*Anorthodes*, n. g., near *Orthodes*, p. 114, for *A. prima*, n. sp., N. America, p. 115; SMITH, Tr. Am. Ent. Soc. xviii.

*Antaplega*: *Sedenia biundulalis*, Zell., referred to this; SMITH, p. 121, Tr. Am. Ent. Soc. xviii.

*Anthophila dissecta*, p. 357, *apicipunctum*, p. 358, fig. 166, *fusciola*, p. 360, *armilla*, p. 361, fig. 238, *divisa*, fig. 234, *scapha*, fig. 236, p. 363, *discreta*, p. 368, fig. 233, *amabilis*, p. 369, fig. 249, *albopicta*, p. 370, fig. 250, Madagascar, SAALMÜLLER, Lep. Madag., n. spp.

*Anuga deleta*, S. India, HAMPSON, p. 81, pl. cxlvi, fig. 15, Ill. Lep. Het. viii, n. sp.

*Apamea velata*, Wlk., = (*sera*, G. & R.) ; SMITH, p. 121, Canad. Ent. xxiii.

*A. cana*, S. India, HAMPSON, p. 79, pl. cxlv, fig. 8, Ill. Lep. Het. viii ;

*A. lunata*, California, SMITH, p. 110, Tr. Am. Ent. Soc. xviii : n. spp.

*Apatela tritona*, larva described ; DYAR, *Ins. Life*, iii, p. 391. *A. innotata*, larva described ; BEUTENMÜLLER, Ent. News, ii, p. 153.

*Aporophylla australis*, variation noticed ; RICHARDSON, Ent. M. M. (2) ii, p. 119.

*Appana rosacea*, Madagascar, SAALMÜLLER, p. 311, fig. 248, Lep. Madag., n. sp.

*Apphadana fuscula*, Madagascar, SAALMÜLLER, p. 489, fig. 194, Lep. Madag., n. sp.

*Aquis viridisquama*, Wlk., = (*albosparsa*, Wlk., and *Dimirica nubifera*, Wlk.) ; BUTLER, Ent. xxiv, p. 238.

*Athyra saalmülleri*, figured, figs. cxliii & cxliv, SAALMÜLLER, Lep. Madag.

*A. intorta*, Bombay, SWINHOE, p. 150, pl. viii, fig. 13, Tr. E. Soc. 1891, n. sp.

*Audea macula*, S. India, HAMPSON, p. 84, pl. cxlvi, fig. 21, Ill. Lep. Het. viii, n. sp.

*Axylia annularis*, Madagascar, SAALMÜLLER, p. 265, Lep. Madag. ; *A. dispalata*, S. India, SWINHOE, p. 145, Tr. E. Soc. 1891 ; *A. albicosta*, S. India, HAMPSON, p. 70, pl. cxliv, fig. 20, Ill. Lep. Het. viii : n. spp.

*Bityla*, sub *Xylina*, *defigurata*, Wlk., = (*thoracica*, Wlk.) ; BUTLER, Ent. xxiv, p. 295.

*Borsippa punctilineata*, S. India, HAMPSON, p. 83, pl. cxlvi, fig. 14, Ill. Lep. Het. viii, n. sp.

*Briada lacinia*, Saalm., figured, fig. 218, redescribed, pp. 425 & 429 ; SAALMÜLLER, Lep. Madag.

*Bryophila discitincta*, Wlk., and *Pachnobia imperita*, Hb., are synonymous ; BUTLER, Ent. xxiv, p. 238.

*B. maderensis*, Madeira, BAKER, p. 205, Tr. E. Soc. 1891 ; *B. ocellata*, Madagascar, SAALMÜLLER, p. 251, fig. 251, Lep. Madag. ; *B. lichenea*, pl. cxliv, fig. 12, *muscosa*, fig. 15, S. India, HAMPSON, p. 72, Ill. Lep. Het. viii, n. spp.

*Calesia fuscicorpus*, S. India, HAMPSON, p. 90, pl. cxlvii, figs. 8 & 9, Ill. Lep. Het. viii, n. sp.

*Callenia luctuæ*, Schiff., = (*Cucullia intermedia*, Speyer) ; BUTLER, Ent. xxiv, p. 264.

† *Callipyris*, n. g., probably allied to *Sophta* and *Sventia*, for *C. drosera*, n. sp., E. Australia ; MEYRICK, p. 195, Tr. R. Soc. S. Austr. xiv.



<sup>v</sup> *Callixena*, n. g., *Xylinides*, p. 324, for *C. versicolora*, n. sp., Madagascar, p. 325, fig. 164, SAALMÜLLER, Lep. Madag.

*Calloplistria*, revised and divided; BUTLER, Ann. N. H. (6) viii, pp. 70-78. *C. miranda* figured, fig. 122, redescribed, p. 371; SAALMÜLLER, Lep. Madag.

*C. rectilinea*, p. 374, *intermissa*, p. 376, Madagascar, *promiscua*, p. 490, fig. 172, SAALMÜLLER, Lep. Madag.; *C. minor*, S. India, HAMPSON, p. 81, pl. cxlvi, figs. 16 & 17, Ill. Lep. Het. viii: n. spp.

*Calophasia strigata*, Colorado, SMITH, p. 107, Tr. Am. Ent. Soc. xviii, n. sp.

*Calpe bifasciata*, E. India, HAMPSON, p. 61, pl. cxli, fig. 11, Ill. Lep. Het. viii, n. sp.

*Calymnia limosa*, p. 298, *alumna*, p. 299, with var. *concinna*, p. 300, fig. 256, Madagascar, SAALMÜLLER, Lep. Madag., n. spp.

*Capnodes disticha*, fig. 176, *alboguttata*, fig. 193. *margineguttata*, fig. 197, Madagascar; SAALMÜLLER, p. 482, Lep. Madag., n. spp.

*C. fasciata*, S. India, HAMPSON, p. 91, pl. cxlvii, fig. 10, Ill. Lep. Het. viii; *C. cascalis*, S. India, SWINHOE, p. 153, pl. viii, figs. 6 & 10, Tr. E. Soc. 1891: n. spp.

*Caradrina obtusa*, pl. cxlv, fig. 6, *euthusa*, fig. 1, *melanosticta*, fig. 13, S. India, HAMPSON, p. 79, Ill. Lep. Het. viii; *C. nitens*, p. 276, fig. 232, *asinina*, p. 277, *pallidula*, p. 278, Madagascar, SAALMÜLLER, Lep. Madag.: n. spp.

*Carneades messoria*, see *Agrotis* and *Mamestra*.

*C. fusimacula*, California, SMITH, p. 105, Tr. Am. Ent. Soc. xviii, n. sp.

*Catabena lineolata*, Wlk., = (*Adipsophanes miscellus*, Gr.); BUTLER, Ent. xxiv, p. 264.

*Catocala flebilis* and *fratercula*, synonymical note; GROTE, Canad. Ent. xxiii, p. 281.

*Celena festivoides*, Gn., referred to *Oligia*; BUTLER, Ent. xxiv, p. 240.

*Cerma olivacea*, Colorado, SMITH, Tr. Am. Ent. Soc. xviii, p. 103, n. sp.

*Chasmina lineæ*, pl. cxlv, fig. 3, *stigmata*, fig. 10, S. India, HAMPSON, p. 73, Ill. Lep. Het. viii, n. spp.

*Chera efflorescens*, fig. 7, *erubescens*, fig. 14, S. India, HAMPSON, p. 78, pl. cxlv, Ill. Lep. Het. viii, n. spp.

*Cirrhophanes duplicatus*, Colorado, SMITH, p. 112, Tr. Am. Ent. Soc. xviii, n. sp.

*Cletthara rabdota*, S. India, HAMPSON, p. 88, pl. cxlvi, fig. 4, Ill. Lep. Het. viii, n. sp.

*Clinæ rufina*, pl. cxlvi, fig. 12, *basalis*, fig. 5, S. India, HAMPSON, p. 86, Ill. Lep. Het. viii, n. spp.

*Cotanda indica*, Hindostan and Sarawak; BUTLER, p. 76, pl. ix, fig. 8, Ann. N. H. (6) viii, n. sp.

*Cucullia scrophulariæ*, specific validity discussed; Ent. xxiv, pp. 146, &c.; SOUTH, t. c. p. 153, pl. iii.

*Curubasa*, *Adisura*, *Pradatta*: notes on their characters and composition; BUTLER, Ent. xxiv, p. 294. *C. (sub Anthophila) marginalis*, Wlk., = *Adisura dulcis*, Moore; BUTLER, Ent. xxiv, p. 294.

*C. depicta*, S. India, SWINHOE, p. 146, pl. viii, fig. 4, Tr. E. Soc. 1891, n. sp.

*Cyligramma*, Boisd.: notes on the species of, with fig. of *fluctuosa*, Dr., fig. 210; SAALMÜLLER, pp. 450-456, Lep. Madag.

*C. consiliatrix*, Nossi-Bé, SAALMÜLLER, p. 456, fig. 127, Lep. Madag.;

*C. amblyops*, W. Africa, MABILLE, p. xc, Bull. Soc. Ent. Fr. 1891 : n. spp.

† *Daula*, n. g., *Orthosiides*, p. 302, for *D. abscissa*, n. sp., Nossi-Bé, p. 303, fig. 180; SAALMÜLLER, Lep. Madag.

† *Delta*, n. g. (*Apamiides*) p. 264, for *D. stolifera*, n. sp., Nossi-Bé, p. 264, fig. 101; SAALMÜLLER, Lep. Madag.

† *Diadocis*, n. g., near *Orthosia*, p. 294, for *D. longimacula*, n. sp., Nossi-Bé, p. 295, fig. 204; SAALMÜLLER, Lep. Madag.

*Dianthæcia barrettii*, variety noticed; BARRETT, Ent. M. M. (2) ii, p. 220.

*D. norma*, p. 305, fig. 245, *glebosa*, p. 306, fig. 253, Madagascar, SAALMÜLLER, Lep. Madag., n. spp.

*Dipterygia nocturna*, S. India, HAMPSON, p. 78, pl. cxlv, fig. 19, Ill. Lep. Het. viii, n. sp.

*Dirades leucocera*, S. India, HAMPSON, p. 102, pl. cl, fig. 13, Ill. Lep. Het. viii, n. sp.

† *Dissolophus*, n. g., pp. 71 & 73, for *Eriopus chloriza*, Gn., *C. repleta*, Wlk., and *D. aluensis*, n. sp., Solomon Is., p. 74; BUTLER, Ann. N. H. (6) viii.

*Doranaga straminea*, S. India, HAMPSON, p. 92, pl. cxlvii, fig. 17, Ill. Lep. Het., n. sp.

*Dorika curta*, S. India, SWINHOE, p. 146, Tr. E. Soc. 1891; *D. ignea*, S. India, HAMPSON, p. 70, pl. cxliv, fig. 21, Ill. Lep. Het. viii : n. spp.

*Dryobata rectifascia*, p. 108, *curvifascia*, p. 109, California, SMITH, Tr. Am. Ent. Soc. xviii, n. spp.

*Dysgonia lenzi*, p. 467, fig. 129, *violaceofascia*, fig. 196, *mæandrica*, fig. 169, p. 469, *decussis*, p. 471, fig. 156, Madagascar, SAALMÜLLER, Lep. Madag., n. spp.

*Ecregma micans*, Madagascar, SAALMÜLLER, p. 403, fig. 177, Lep. Madag., n. sp.

*Egnasia polia*, pl. cxlvii, fig. 4, *grisangula*, fig. 3, S. India, HAMPSON, p. 90, Ill. Lep. Het. viii, n. spp.

† *Elaphristis*, n. g., near *Acrarmostis*, for *E. anthracia*, n. sp., Queensland; MEYRICK, Tr. R. Soc. S. Austr. xiv, p. 198.

† *Ellyptron*, n. g., between *Cerastis* and *Calymnia*, p. 300, for *E. cinctum*, n. sp., Madagascar, p. 301, fig. 254; SAALMÜLLER, Lep. Madag.

*Epunda albstigmata*, Madeira, BAKER, p. 206, Tr. E. Soc. 1891, n. sp.

*Erastria venustula*, auct., referred to *Hapalotis*, Hb.; BUTLER, Ent. xxiv, p. 113. *E. scitula*, metamorphoses; XAMBEU, Le Nat. 1891, p. 196.

*E. miasma*, S. India, HAMPSON, p. 73, pl. cxlv, fig. 16, Ill. Lep. Het. viii; *E. muscosa*, p. 338, fig. 241, *virescens*, p. 339, fig. 239, *aurantiaca*, p. 341, fig. 192, *sagitta*, p. 342, fig. 246, *opposita*, p. 345, fig. 255, *elegans*, p. 347, fig. 242, *suavis*, p. 349, Madagascar, SAALMÜLLER, Lep. Madag. : n. spp.

*Erebus odora*, introduction to N. America ; DUZEE, Ent. News, ii, p. 30.  
*Eriopus*, merged in *Callopietria* ; BUTLER, p. 70, Ann. N. H. (6) viii.  
*E. latreillei*, note on some Madeiran examples ; BAKER, p. 207, Tr. E. Soc. 1891.

*Brosiidae* : alliance with *Drepanulidae* suggested ; HAMPSON, p. 102, Ill. Lep. Het. viii.

*Erosia albida*, pl. cl, fig. 10, p. 102, *unicauda*, fig. 21, *longipennis*, fig. 20, *fulvilinea*, fig. 19, p. 103, S. India, HAMPSON, Ill. Lep. Het. viii, n. spp.

*Erygia reflectifascia*, S. India, HAMPSON, p. 85, pl. cxlvi, fig. 18, Ill. Lep. Het. viii, n. sp.

*Euperia fulvago*, larva described ; PORRITT, Ent. M. M. (2) ii, p. 121.

*Euplexia habilis*, Madagascar, SAALMÜLLER, p. 313, fig. 243, Lep. Madag. ; *E. fasciata*, S. India, HAMPSON, p. 77, pl. cxlv, fig. 20, Ill. Lep. Het. viii : n. spp.

*Eustrotia caduca*, preparatory stages ; KELLICOTT, Ins. Life, iii, p. 321.

*Eutelia exquisita*, p. 379, fig. 175, *cuneata*, p. 381, fig. 179, *procera*, p. 383, Madagascar, SAALMÜLLER, Lep. Madag., n. spp.

*Euterpia laudeti* n. var. *roseomarginata* ; CALBERLA, Deutsche e. Z. Lep. iv, p. 44.

*Gonodonta unica*, Florida, NEUMOEGEN, Canad. Ent. xxiii, p. 125, n. sp.

*Gnamptocera*, n. g., for *Callopietria minuta*, Butl., and *minor*, Hampson ; BUTLER, pp. 71 & 73, Ann. N. H. (6) viii.

*Gortyna cataphracta*, larva described ; DYAR, p. 157, Canad. Ent. xxiii.

*G. intermixta*, Khasia Hills, SWINHOE, p. 480, Tr. E. Soc. 1891, n. sp.

*Graphiphora* : to be used in place of *Taniocampa* ; GROTE, Canad. Ent. xxiii, p. 101.

*Gyrtona chalybsa*, S. India, HAMPSON, p. 86, pl. cxlvi, fig. 24, Ill. Lep. Het. viii ; *G. exsiccata*, S. India, SWINHOE, p. 149, pl. viii, fig. 5, Tr. E. Soc. 1891 : n. spp.

*Hadena arcta*, Led., = (*Raphia fasciata*, Butl.) ; BUTLER, Ent. xxiv, p. 240. *H. senescens*, Gr., = (*Orthosia semisigna*, Wlk.) ; *id. t. c.* p. 241. *H. ducta*, Grt., is probably *Mamestra insulsa*, Wlk. ; SMITH, p. 118, Canad. Ent. xxiii.

*H. atlanticum*, Madeira, BAKER, p. 207, Tr. E. Soc. 1891 ; *H. œnea*, p. 315, fig. 205, *semiumbrata*, p. 317, fig. 230, *transcursa*, p. 319, *tulipifera*, p. 321, fig. 195, Madagascar, SAALMÜLLER, Lep. Madag., n. spp.

*Haploolophus*, n. g., for *Eriopus mollissima*, Gn. ; BUTLER, pp. 71 & 73, Ann. N. H. (6) viii.

*Harrisimemna trisignata*, mode of pupation ; SOULE, Psyche, vi, p. 53.

*Hecatera*, sub *Celæna*, *erecta*, Wlk., = (*Perigea constipata*, Wlk., = *Mamestra innexa*, Gr.) ; BUTLER, Ent. xxiv, p. 241.

*H. fatuellæ*, Loja, DOGNIN, Le Nat. 1891, p. 211, n. sp.

*Heliochilus inflatus*, Wall., = (*Perigea albidentina*, Wlk.) ; BUTLER, Ent. xxiv, p. 265.

*Heliodes* : *arbuti* is the type ; BUTLER, Ent. xxiv, p. 294.

*Heliodora*, n. g. near *Schinia*, for *H. magnifica*, n. sp., Texas ; NEUMOEGEN, p. 125, Canad. Ent. xxiii.

*Heliophana obliquata*, Texas, *amaryllis*, California, SMITH, p. 130, Tr. Am. Ent. Soc. xviii, n. spp.

*Heliothis armigera*, report on ; MALLY (559). *H. armigera* and allies, notes on variation and synonymy ; BUTLER, Ent. xxiv, p. 264. *H. dipsacea*, var. = (*adaucta*, Butl.), *H. scutuligera*, Gn., = *errans*, Wlk. ; *id.* t. c. p. 265.

*Hemiceras hieroglyphica*, Madagascar, SAALMÜLLER, p. 405, fig. 208, Lep. Madag., n. sp.

↓ *Hemipachycera*, n. g., for part of *Callopietria* ; BUTLER, pp. 71 & 75, Ann. N. H. (6) viii.

~ *Hemipsestra*, n. g., near *Phurys*, for *H. plumipars*, n. sp., S. India, pl. cxlvii, fig. 23, HAMPSON, p. 84, Ill. Lep. Het. viii.

*Hiptelia*? *lorezi*, Switzerland, STAUDINGER, Soc. Ent. vi, p. 137, n. sp.

*Homohadena*, revision of ; SMITH, pp. 397-405, P. U. S. Nat. Mus. xiii. *H. infixa*, Wlk., = (*incomitata*, Harvey, and *badistriga*, Grt.) ; PATTON, Ent. News, ii, p. 236.

*H. deserta*, Colorado, SMITH, p. 402, P. U. S. Nat. Mus. xiii, n. sp.

↓ *Hubnerius*, n. g., without characters for *Phyllodes dux*, Saalm., which is figured, fig. 128, redescribed, p. 446 ; SAALMÜLLER, Lep. Madag.

*Hyboma nigrivitta*, S. India, HAMPSON, p. 72, pl. cxliv, fig. 19, Ill. Lep. Het. viii, n. sp.

*Hydrelia ferruginea*, Wlk. queried as a *Calymentia* ; BAKER, p. 210, Tr. E. Soc. 1891.

*Hyela senna*, S. India, SWINHOE, p. 148, pl. viii, fig. 14, Tr. E. Soc. 1891, n. sp.

↓ *Hyperdasys*, n. g., for *Callopietria exotica*, Gn., and *insularis*, Butl. ; BUTLER, pp. 71 & 74, Ann. N. H. (6) viii.

*Hyppogramma uncinata*, Madagascar, SAALMÜLLER, p. 431, fig. 162, Lep. Madag., n. sp.

*Hyospila trimacula*, fig. 187, *nigropicta*, fig. 189, *biplagula*, fig. 190, Madagascar, SAALMÜLLER, p. 480, Lep. Madag., n. spp.

*Ischygia glaucopteron*, S. India, HAMPSON, p. 88, pl. cxlvii, fig. 19, Ill. Lep. Het. viii, n. sp.

↓ *Kalmina*, n. g. *Bendide*, p. 480, for *K. ochracea*, n. sp., Khasia Hills, p. 481, pl. xix, fig. 3 ; SWINHOE, Tr. E. Soc. 1891.

*Leocyma tibialis*, Fab., = (*dianæ*, Gn., = *Chasmina glabra*, Wlk.) ; L., sub *Acontia*, *judicata*, Wlk., = (*Chasmina linea*, Hampson, *suprà*) ; BUTLER, Ent. xxiv, p. 266.

*L. vates*, Nossi-Bé, SAALMÜLLER, p. 329, fig. 109, Lep. Madag., n. sp.

*Leucania littoralis*, metamorphoses described and figured ; SEPP, Nederl. Ins. (2) iv, pp. 233-241, pl. xli.

*L. simplaria*, p. 252, Nossi-Bé, fig. 160, *pinna*, p. 253, *insulicola* (Gn.), p. 254, *infrargyrea*, p. 256, fig. 158, *umbriger*, p. 258, Nossi-Bé, *operosa*, p. 259, *angustipennis*, p. 261, fig. 252, Madagascar, SAALMÜLLER, Lep. Madag. ; *L. micacea*, pl. cxliv, fig. 8, *curvilinea*, fig. 3, p. 67, *mediofusca*, fig. 9, *stramen*, fig. 2, *albivitta*, fig. 16, p. 68, *semiusta*, fig. 17, *vittata*, fig. 4, *v-album*, fig. 10, p. 69, S. India, HAMPSON, Ill. Lep. Het. viii : n. spp.

*Lithophane*, sub *Xylina*, *signosa*, Wlk., = (*petulca*, Gr.); BUTLER, Ent. xxiv, p. 242. *L. lambda* = (*thaxteri*, Gr.); BUTLER, t. c. p. 263.

*Lugana rufula*, S. India, HAMPSON, p. 81, pl. cxlvi, figs. 22 & 23, n. sp.

*Luperina*: revision of the N. American species; SMITH, pp. 407-412, P. U. S. Nat. Mus. xiii.

*Lygranthæcia roseitincta*, Haw., = (*Melicleptria exaltata*, H. Edw.); SMITH, p. 124, Tr. Am. Ent. Soc. xviii. *L. separata*, Gr., synonymical note; BUTLER, Ent. xxiv, p. 292.

*Mamestra*: revision of the N. American species; SMITH, P. U. S. Nat. Mus. xiv, pp. 197-276, pls. viii-xi. *M. chalconia* = (*Miana vineta*, Wlk., = *Celena irresoluta*, Wlk., = *Oligia tracta*, Gr.); *M.*, sub *Agrotis*, *radix*, Wlk., = (*dimmockii*, Gr.); BUTLER, Ent. xxiv, p. 240. *M. dispiciens*, Wlk., and *M. inextricata*, Wlk., are *Carneades messoria*; *M. unicolor*, Wlk., is *Noctua clandestina*, Har., as is also *nigriceps*, Wlk.; SMITH, Canad. Ent. xxiii, pp. 119 & 120. *M. adusta*, metamorphoses described and figured; SEPP, Nederl. Ins. (2) iv, pp. 211-218, pl. xxxviii. *M. persicaria*, notes on in 1890; ORMEROD, Rep. 1890, p. 61.

*M. (Hecatera) maderæ*, Madeira, BAKER, p. 205, pl. xii, fig. 3, Tr. E. Soc. 1891; *M. intricata*, Madagascar, SAALMÜLLER, p. 269, Lep. Madag.; *M. determinata*, p. 209, *desperata*, p. 221, *invalida*, p. 225, *u-scripta*, p. 228, *quadrata*, p. 248, *circumcincta*, p. 253, *longiclava*, p. 265, *orbiculata*, p. 266, N. America, SMITH, P. U. S. Nat. Mus. xiv: n. spp.

*Marimatha freda*, S. India, p. 147, Tr. E. Soc. 1891, n. sp.

*Maronis*, n. g., near *Anomis*, p. 409, for *M. rivosia*, n. sp., Madagascar, p. 410, fig. 170; SAALMÜLLER, Lep. Madag.

*Masalia dora*, S. India, SWINHOE, p. 147, Tr. E. Soc. 1891; *M. terracotta*, pl. cxliv, fig. 22, *rosacea*, fig. 23, S. India, HAMPSON, p. 71, Ill. Lep. Het. viii: n. spp.

*Matella euphrona*, S. India, SWINHOE, p. 151, pl. viii, fig. 16, Tr. E. Soc. 1891: n. sp.

*Megacephalon rivulosum*, *stygium*, figured and redescribed; SAALMÜLLER, figs. 130 & 135, pp. 448 & 449, Lep. Madag.

*Melicleptria*, Hb.: notes on its composition; BUTLER, Ent. xxiv, p. 293.

*Melipotis mahagonica*, W. Africa and Nossi-Bé, SAALMÜLLER, p. 442, fig. 184, Lep. Madag., n. sp.

*Mestlela quadrapex*, pl. cxlvii, fig. 15, p. 91, *rubra*, fig. 16, p. 92, S. India, HAMPSON, Ill. Lep. Het. viii, n. spp.

*Metachrosis robusta*, Nossi-Bé, SAALMÜLLER, p. 353, Lep. Madag, n. sp.

*Methorasa cordata* and *monetifera*, notes on; BUTLER, Ann. N. H. (6) viii, pp. 72 & 73.

*Metoponia macula*, New Mexico, SMITH, p. 132, Tr. Am. Ent. Soc. xviii, n. sp.

*Miana strigilis*, *fusciuncula*, distinctions of; SOUTH, Ent. xxiv, p. 25. *M. segregata*, Butl., referred to *Telesilla*; BUTLER, p. 462, Ann. N. H. (6) vii.

*Nagadeba mistura*, S. India, SWINHOE, p. 151, Tr. E. Soc. 1891, n. sp.

*Namangana*, Stgr. : note on the application of the name ; RIESEN, p. 15, S. E. Z. 1891.

*Nephelodes violans*, metamorphoses described and figured ; RILEY, Rep. 1890, pp. 244-246, pl. iii, fig. 3.

*Noctua sobrina*, range in Britain ; WHITE, Scot. Nat. 1891, p. 40.

*Nolaphana* and *Pseudina* referred to *Bryophilidæ* ; BUTLER, Ent. xxiv, p. 238.

*Nonagria sacchari*, Woll., figured, pl. xii, fig. 4 ; BAKER, Tr. E. Soc. 1891.

*Nyssocnemis dubiosa*, Madeira, BAKER, p. 209, Tr. E. Soc. 1891, n. sp.

\**Ogdoconta*, n. g., for the N. American species placed in *Telesilla* ; BUTLER, p. 462, Ann. N. H. (6) vii.

*Oligia*, sub *Celena*, *excisa*, Gn., = (*Hadena floridana*, Wlk.) ; BUTLER, Ent. xxiv, p. 241.

*Opigena monostigma*, Nossi-Bé, SAALMÜLLER, p. 287, fig. 104, Lep. Madag., n. sp.

*Oræsia cuprea*, Delagoa Bay, Nossi-Bé, SAALMÜLLER, p. 400, fig. 238, Lep. Madag., n. sp.

*Orrhodia californica*, Sierra Nevada, SMITH, p. 112, Tr. Am. Ent. Soc. xviii, n. sp.

*Orthosia sinens*, Wlk., referred to *Momaphana* and figured, pl. cxliv, fig. 6 ; HAMPSON, p. 71, Ill. Lep. Het. viii.

*O. gemmella*, Madagascar, SAALMÜLLER, p. 292, fig. 258, Lep. Madag. ; *O. bicornis*, S. India, HAMPSON, p. 77, pl. cxlv, fig. 18, Ill. Lep. Het. viii : n. spp.

*Ozarba lepida*, p. 280, Madagascar, fig. 247, *perplexa*, p. 281, fig. 161, Nossi-Bé, SAALMÜLLER, Lep. Madag. ; *O. bipars*, pl. cxlv, fig. 2, p. 75, *O. ? emarginata*, fig. 22, *curvifascia*, fig. 23, *O. excisa*, fig. 21, p. 76, E. India, HAMPSON, Ill. Lep. Het. viii : n. spp.

\**Ozopteryx*, n. g., near *Homoptera*, p. 423, for *O. basalis*, n. sp., Madagascar, p. 424 ; SAALMÜLLER, Lep. Madag.

*Pachnobia leucographa*, life history ; ARKLE, Ent. xxiv, p. 51.

*P. cinerascens*, California, p. 103, *elevata*, Colorado, p. 104, SMITH, Tr. Am. Ent. Soc. xviii, n. spp.

*Palpangula stuebeli*, Syria, CALERBA, p. 49, Deutsche e. Z. Lep. iv, n. sp.

*Pasipeda phaiosoma*, S. India, HAMPSON, p. 90, pl. cxlvii, fig. 2, Ill. Lep. Het. viii, n. sp.

*Penicillaria ocularis*, p. 388, fig. 202, Madagascar, SAALMÜLLER, Lep. Madag. ; *P. chalybea*, S. India, HAMPSON, p. 80, pl. cxlvi, fig. 1, Ill. Lep. Het. viii : n. spp.

*Perigea meleagris*, Nossi-Bé, SAALMÜLLER, p. 271, fig. 228, Lep. Madag. ; *P. pulverulenta*, N. America, SMITH, p. 105, Tr. Am. Ent. Soc. xviii : n. spp.

*Perigrapha prima*, California, SMITH, p. 119, Tr. Am. Ent. Soc. xviii, n. sp.

*Phlogophora wollastoni*, Madeira, BAKER, p. 208, Tr. E. Soc. 1891, n. sp.

*Phurys ochreifascia*, pl. cxlvi, fig. 2, *leucopos*, fig. 10, p. 83, *notata*, fig. 3, p. 84, HAMPSON, Ill. Lep. Het. viii, n. spp.

†*Pilosocruces*, n. g., *Catephidæ*, near *Batracharta*, for *P. variegata*, n. sp., S. India, pl. cxlvi, fig. 20 ; HAMPSON, p. 85, Ill. Lep. Het. viii.

*Platyja exviola*, S. India, HAMPSON, p. 91, pl. cxlvii, fig. 18, Ill. Lep. Het. viii, n. sp.

†*Pleroma*, n. g., near *Xylina*, p. 113, for *P. obliquata*, n. sp., N. America, p. 114 ; SMITH, Tr. Am. Ent. Soc. xviii.

*Plusia bimaculata*, Steph., = (*verticillata*, Gn.) ; MASON, Ent. M. M. (2) ii, p. 163, and STAINTON, t. c. p. 207. *P. gamma*, migrating swarms ; HONRATH, B. E. Z. xxxvi, p. ix, SB. *P. moneta*, distribution ; HOFFMANN, Ent. M. M. (2) ii, p. 21.

*P. hildebrandti*, Madagascar, SAALMÜLLER, p. 392, Lep. Madag. ; *P. angulidens*, Colorado, SMITH, p. 111, Tr. Am. Ent. Soc. xviii : n. spp.

*Poaphila erica*, S. India, SWINHÖE, p. 149, pl. viii, fig. 15, Tr. E. Soc. 1891 ; *P. fasciata*, pl. cxlvi, fig. 8, *melunocephala*, fig. 9, *marmorea*, fig. 7, S. India, HAMPSON, p. 82, Ill. Lep. Het. viii : n. spp.

*Polia maura*, Madagascar, SAALMÜLLER, p. 308, fig. 235, Lep. Madag. ; *P. pulverulenta*, Colorado, SMITH, p. 106, Tr. Am. Ent. Soc. xviii : n. spp.

*Pradatta pallescens*, p. 70, pl. cxliv, fig. 5, *pulverulenta*, fig. 11, p. 71, S. India, HAMPSON, Ill. Lep. Het. viii, n. spp.

†*Proluta*, n. g., near *Epimecia*, p. 326, for *P. deflexa*, n. sp., Nossi-Bé, p. 327, fig. 178 ; SAALMÜLLER, Lep. Madag.

†*Prominea*, n. g., without characters, for *Capnodes porrecta*, Saalm., which is figured, fig. 146 ; SAALMÜLLER, p. 482, Lep. Madag.

†*Pterogonia*, n. g. *Thermesiidæ*, for *P. episcopalis*, n. sp., S. India, and including *Doranaga strintura*, Moore ; SWINHÖE, p. 152, Tr. E. Soc. 1891.

*Pyrrhia umbra*, Hfn., = (*exprimens*, Gr.) ; *P. exprimens*, Wlk., = (*angulata*, Gr.) ; BUTLER, Ent. xxiv, p. 292.

*Radinacra mus*, S. India, p. 77, pl. cxlv, fig. 9, HAMPSON, Ill. Lep. Het. viii, n. sp.

†*Rhoptotrichia*, n. g., for *Callopietria recurvata*, Moore, and *Perigea* ? *argyrosticta*, Butl. ; BUTLER, pp. 71 & 76, Ann. N. H. (6) viii.

†*Rimulia*, n. g., without characters, for *M. malgassica*, n. sp., Madagascar, p. 173 ; SAALMÜLLER, p. 483, Lep. Madag.

*Sartha*, n. n. for *Namangana*, Staud., p. 59, S. E. Z. 1888, nec Staud., p. 29, S. E. Z. 1888 ; STAUDINGER, p. 229, S. E. Z. 1891.

*Schinia trifascia*, Hb., = (*Anthophila lineata*, Wlk.) ; BUTLER, Ent. xxiv, p. 292.

*S. seaplugiata*, p. 124, *brucei*, *diffusa*, p. 125, *ochreifascia*, *unimacula*, p. 126, *bicuspidata*, p. 127, *concinna*, *digitalis*, p. 128, *biundulata*, *simplex*, *crenilinea*, p. 129, N. America, SMITH, Tr. Am. Ent. Soc. xviii, n. spp.

*Scopelosoma moffatiana* and *græfiana*, distinctions of ; MOFFAT, p. 178, Canad. Ent. xxiii.

*Selepa grisea*, pl. cxlvi, fig. 13, *nadgani*, fig. 6, S. India, HAMPSON, p. 87, Ill. Lep. Het. viii, n. spp.

*Semiophora ochracea* = (*Graphiphora viaria*, Swinh.) ; BUTLER, Ent. xxiv, p. 240. *S.* (sub *Hadena*) *tenebrifera*, Wlk., = (*catherina*, Grt.) ; SMITH, p. 120, Canad. Ent. xxiii.

*Sesamia madagascariensis*, Nossi-Bé, SAALMÜLLER, p. 262, Lep. Madag. n. sp.

*Sonagra radigera*, Madagascar, SAALMÜLLER, p. 483, fig. 201, Lep. Madag., n. sp.

*Spiramia indenta*, S. India, HAMPSON, p. 89, pl. cxlvii, figs. 20 & 21, Ill. Lep. Het. viii, n. sp.

\**Stictoptera pæcilosoma*, figured, figs. 99 & 120, redescribed and referred to *Steiria*, p. 491, varr. *latifica*, fig. 100, *semipartita*, fig. 124, figured ; SAALMÜLLER, Lep. Madag.

*Strenoloma*, Gr., systematic position to be changed ; BUTLER, Ent. xxiv, p. 240.

*Stretchia variabilis*, Colorado, SMITH, p. 119, Tr. Am. Ent. Soc. xviii, n. sp.

\**Stylopora*, n. g. (*Heliothides*), for *S. cephalica*, n. sp., California ; SMITH, p. 131, Tr. Am. Ent. Soc. xviii.

*Symitha nigridisca*, S. India, HAMPSON, p. 87, pl. cxlvi, fig. 11, Ill. Lep. Het. viii, n. sp.

*Sypna ochreicilia*, S. India, HAMPSON, p. 89, pl. cxlvii, fig. 1, Ill. Lep. Het. viii, n. sp.

*Teniocampa* (sub *Apamea*) *rubrescens*, Wlk., = (*venata*, Sm.) ; SMITH, p. 121, Canad. Ent. xxiii. *T. alia*, larva described ; DYAR, p. 156, Canad. Ent. xxiii. *T. oviduca* = (*orobia*, Harv.), p. 116 ; *T. pectinata*, Smith, referred to *Perigonica*, p. 118 ; SMITH, Tr. Am. Ent. Soc. xviii.

*T. annulimacula*, Texas, p. 117, *trifascia*, Colorado, p. 118, SMITH, Tr. Am. Ent. Soc. xviii, n. spp.

*Tarache melanchlœna*, S. India, SWINHOE, p. 148, Tr. E. Soc. 1891, n. sp.

\**Teinoptera*, n. g., affinities not mentioned, for *T. culminifera*, n. sp., Syria ; CALBERLA, p. 46, Deutsche e. Z. Lep. iv.

*Telesilla carneola*, New Mexico, SMITH, p. 110, Tr. Am. Ent. Soc. xviii, n. sp.

*Thalpochares basilissa*, *pyraspis*, p. 196, *chryaspis*, p. 197, Queensland, MEYRICK, Tr. R. Soc. S. Austr. xiv, n. spp.

*Thiganusa*, Wlk. : position to be near *Xanthodes*, *T.*, sub *Leocyma*, *apollinis*, Gn., = (*euproctisoides*, Wlk.) ; BUTLER, Ent. xxiv, p. 266.

\**Thyreion*, n. g., for Grote's species of *Ædophron*, and *T. rosea*, n. sp., Colorado ; SMITH, Tr. Am. Ent. Soc. p. 122.

\**Timæa*, n. n., to replace *Charidea*, Gn., with *T. pictura*, n. sp., Madagascar, p. 309, fig. 240 ; SAALMÜLLER, Lep. Madag.

*Toxocampides* : validity of the group queried ; BUTLER, Ent. xxiv, p. 239.

*Toxocampa* and *Eccrita* : validity discussed ; BUTLER, Ent. xxiv, p. 239.

*T. cancellata*, Madagascar, SAALMÜLLER, p. 414, fig. 186, Lep. Madag., n. sp.



*Tructa*, n. g. *Thermesiides*, for *Capnodes albooculata*, Saalm., which is figured, fig. 151, redescribed, p. 479; SAALMÜLLER, Lep. Madag.

*Trichoclea postica*, Colorado, p. 115, *antica*, California, p. 116, SMITH, Tr. Am. Ent. Soc. xviii, n. spp.

*Trileuca dentalis*, Texas, SMITH, p. 123, Tr. Am. Ent. Soc. xviii, n. sp.

*Triphæna tenebricosa*, Nossi-Bé, SAALMÜLLER, p. 288, fig. 174, Lep. Madag., n. sp.

*Varnia fenestrata*, Laos, POUJADE, p. lxiii, Bull. Soc. Ent. Fr. 1891, n. sp.

*Viminia rumicis*, *venosa*, *auricoma*, *myricæ*, *menyanthidis*: eggs figured; CHAPMAN, Ent. Rec. ii, p. 1, pl. vii.

*Westermannia argentea*, S. India, HAMPSON, pl. cxlvi, fig. 19, p. 80, Ill. Lep. Het. viii, n. sp.

*Xanthoptera ossea*, Nossi-Bé, SAALMÜLLER, p. 356, Lep. Madag., n. sp.

*Xylinia antennata*, Wlk., = (*cinerea*, Ril., and *laticinerea*, Gr.); BUTLER, Ent. xxiv, p. 242. *X. mirabilis* referred to *Saronaga*; *id. t. c.* p. 237.

*Xylophasia*: revision of the N. American species; SMITH, P. U. S. Nat. Mus. xiii, pp. 407-447. *X. apamiformis*, Gn., = (*Hadena contenta*, Wlk.); BUTLER, Ent. xxiv, p. 241.

*X. cogitata*, p. 421, *alticola*, p. 423, *nigrrior*, p. 437, *antennata*, p. 439, *centralis*, p. 441, N. America; SMITH, P. U. S. Nat. Mus. xiii: n. spp.

*Zethes simia*, fig. 155, *vitrea*, p. 474, *sagittula*, p. 476, fig. 168, Madagascar, SAALMÜLLER, Lep. Madag., n. spp.

↓ *Zobia*, n. g., for *Ingura snelleni*, Saalm., which is figured fig. 105; SAALMÜLLER, p. 384, Lep. Madag.

*Zotheca tranquilla*, larva described; DYAR, p. 205, Canad. Ent. xxiii.

#### DELTOIDIDÆ.

[Cf. DRUCE (337), HAMPSON (369), POUJADE (667), SAALMÜLLER (759), SYVINHOE (852).]

*Argania*, n. g., near *Bocana*, for *A. pilosa*, n. sp., Guatemala, pl. xl, figs. 6 & 7, DRUCE, p. 480, Biol. Centr. Am. Heter. i.

↓ *Ariphrades*, n. g., p. 481, for *A. setula*, n. sp., Panama, p. 482, pl. xl, figs. 9 & 9a; DRUCE, Biol. Centr. Am. Heter. i.

*Aristaria lydia*, pl. xxxvii, fig. 20, *A. (?) lysis*, fig. 21, p. 458, *lycaon*, fig. 22, *apicata*, fig. 23, *mæra*, fig. 24, p. 459, Central America, DRUCE, Biol. Centr. Am. Heter. i, n. spp.

*Avitta luna*, S. India, HAMPSON, p. 100, pl. clxviii, fig. 21, Ill. Lep. Het. viii, n. sp.

*Bertula talausalis*, Wlk., figured, pl. xxxix, figs. 18 & 19, Biol. Centr. Am. Heter. i.

*B. lycas*, Guatemala, p. 476, pl. xxxix, figs. 20 & 20a, DRUCE, Biol. Centr. Am. Heter. i; *B. partita*, S. India, HAMPSON, p. 99, pl. cxlviii, fig. 13, Ill. Lep. Het. viii: n. spp.

*Bleptina* : the following species are referred to *Neohermينيا* (*cæpioalis*) as *pyramusalis*, *censalis*, figured, pl. xxxix, fig. 7, *dimplialis*, fig. 8, *stalemusalis*, figs. 12 & 13, *thisbesalis*; DRUCE, pp. 472-474, Biol. Centr. Am. Heter. i. *B. theroalis* Wlk., pl. xxxix, fig. 23, *pagasusalis*, figs. 24 & 25, referred to *Bocana*, and figured; *id.* p. 477, *t. c.* *B. bizialis*, Wlk., referred to *Palthis*, and figured, pl. xxxix, figs. 14 & 15; *id.* p. 475, *t. c.* *B. albibasalis*, Wlk., referred to *Gaberasa*, p. 463, and figured, pl. xxxviii, figs. 11 & 12; *id. t. c.*

*Bleptina malia*, p. 37, fig. 12, *B. (?) lascea*, fig. 13, p. 455, *antinae*, fig. 14, *magas*, fig. 15, *antelia*, fig. 16, *aratus*, fig. 17, *macedo*, fig. 18, p. 456, *lyceus*, fig. 19, p. 457, Panama, DRUCE, Biol. Centr. Am. Heter. i, n. spp.

*Bocana pharusalis*, Wlk., figured, pl. xxxix, figs. 21 & 21a, Biol. Centr. Am. Heter. i.

*Bocana flavopunctatis*, Laos, POUJADE, p. cxxviii, Bull. Soc. Ent. Fr. 1891; *B. malis*, pl. xxxix, fig. 22, *lyse*, figs. 26 & 26a, p. 477, *antorides*, figs. 27 & 27a, *B. (?) anteros*, pl. xl, figs. 1 & 1a, *B. lycaste*, pl. xxxix, figs. 28 & 29, p. 478, *maia*, pl. xl, fig. 2, *B. (?) arbona*, pl. xl, fig. 3, *marpesia*, fig. 4, p. 479, Central America, DRUCE, Biol. Centr. Am. Heter. i : n. spp.

*Bracharthrion*, n. g. *Hermiiniide*, near *Bertula*, for *B. maculapex*, n. sp., S. India, pl. cxlviii, figs. 4 & 11; HAMPSON, p. 99, Ill. Lep. Het. viii.

*Byturna rufifascia*, S. India, HAMPSON, p. 100, pl. cxlviii, fig. 6, Ill. Lep. Het. viii, n. sp.

*Cryptomeria mabiliei*, figured, fig. 209; SAALMÜLLER, Lep. Madag.

*Dichromia mollis*, Khasia Hills, SWINHOE, p. 481, Tr. E. Soc. 1891, n. sp.

† *Dida*, n. g., for *D. cidaria*, n. sp., Mexico, pl. xli, fig. 8; DRUCE, p. 490, Biol. Centr. Am. Heter. i.

† *Didugua*, n. g., of doubtful position, for *D. argentilinea*, n. sp., Guatemala, pl. xl, fig. 13; DRUCE, p. 483, Biol. Centr. Am. Heter. i.

*Epizeuxis lineosa*, figured, fig. 159, diagnosis, p. 479, SAALMÜLLER, Lep. Madag. (? n. sp.); *E. (?) anticlea*, pl. xxxviii, fig. 18, *maceria*, fig. 19, *anser*, fig. 20, Central America, DRUCE, p. 466, Biol. Centr. Am. Heter. i : n. spp.

*Gaberasa anxu*, pl. xxxviii, figs. 7 & 8, *manes*, figs. 9 & 10, p. 462, *G. (?) albipunctalis*, figs. 13 & 13a, p. 463, DRUCE, Biol. Centr. Am. Heter. i, n. spp.

*Helia fuscicosta*, pl. cxlviii, fig. 15, *cidaroides*, fig. 12, S. India, HAMPSON, p. 101, Ill. Lep. Het. viii, n. spp.

*Herminia rhetusalis*, Wlk., referred to *Crymona*; DRUCE, p. 457, Biol. Centr. Am. Heter. i.

*H. ruptistigma*, S. India, HAMPSON, p. 100, pl. cxlviii, fig. 20, Ill. Lep. Het. viii, n. sp.

*Hormisa anduca*, pl. xxxv, fig. 26, *larymna*, fig. 27, Panama, DRUCE, p. 441, Biol. Centr. Am. Heter. i, n. spp.

*Hypena scissilinea*, Wlk., figured and referred to *Saserna* (*infra*); DRUCE, p. 444, pl. xxxvi, fig. 9, Biol. Centr. Am. Heter. i. *H. rostralis*, larva described; PORRITT, Ent. M. M. (2) ii, p. 73. *H. (Bomolocha) abalienalis*, larva described; DYAR, Canad. Ent. xxiii, p. 158.

*H. daria*, p. 482, pl. xix, fig. 14, *laxia*, p. 483, Khasia Hills, SWINHOE, Tr. E. Soc. 1891; *H. assimilis*, pl. cxlvii, fig. 6, p. 93, *persimilis*, fig. 13, *griseapex*, fig. 7, *squamea*, fig. 22, *strigosa*, fig. 14, p. 94, *nilgirica*, pl. cxlviii, fig. 1, *minor*, fig. 22, p. 95, *rectifascia*, fig. 2, *griseivitta*, fig. 8, *tristis*, fig. 14, *uniformis*, fig. 7, p. 96, *olivacea*, fig. 19, *albifusa*, fig. 9, *notata*, fig. 23, p. 97, *eurhipoides*, fig. 16, *curvilinea*, fig. 18, p. 98, S. India, HAMPSON, Ill. Lep. Het. viii : n. spp.

*Hyenodes macula*, pl. xxxvi, fig. 1, *H. ? lysizona*, pl. xxxvi, fig. 2, p. 441, *apis*, fig. 3, p. 442, Panama, DRUCE, Biol. Centr. Am. Heter. i, n. spp.

*Hypoechana*, n. g., near *Bocana*, for *H. fuliginosa*, n. sp. Central America, pl. xl, fig. 8; DRUCE, p. 481, Biol. Centr. Am. Heter. i.

*Ipmea marina*, pl. xl, fig. 10, *ardalus*, fig. 11, p. 482, *I. (?) mapeta*, fig. 12, p. 483, Central America, DRUCE, Biol. Centr. Am. Heter. i, n. spp.

*Lametia*, sexual distinctions noticed, p. 442, *L. ignitalis*, figured, pl. xxxv, fig. 28; DRUCE, Biol. Centr. Am. Heter. i.

*L. anemolia*, Mexico, DRUCE, p. 442, pl. xxxvi, fig. 5, Biol. Centr. Am. Heter. i, n. sp.

*Lascoria*, Wlk., systematic position noticed, p. 461, *L. phormisalis* figured, pl. xxxviii, figs. 14 & 15; DRUCE, Biol. Centr. Am. Heter. i.

*Ledeæ*, n. n. for *Legna*, Wlk. (Cat. xxxiii, p. 1102), p. 484, with the following n. spp. : *arduine*, pl. xl, figs. 17 & 18, *marcella*, fig. 19, and *L. (?) arciva*, fig. 20, Central America, p. 485; DRUCE, Biol. Centr. Am. Heter. i.

*Lobocheilos*, n. g., *Herminiidæ*, for *L. illattioides*, n. sp., S. India, pl. cxlviii, fig. 10; HAMPSON, p. 98, Ill. Lep. Het. viii.

*Mamerthes*, n. g., near *Simplicia*, p. 449, for *M. nigrilinea*, n. sp. Central America, p. 450, pl. xxxvii, figs. 1 & 2; DRUCE, Biol. Centr. Am. Heter. i.

*Marca*, n. g. (*Hypenidæ*), without characters, for *M. proclinata*, n. sp., Nossi-Bé, fig. 138; SAALMÜLLER, p. 486, Lep. Madag.

*Margites*, n. g., near *Bocana*, for *M. bugaba*, n. sp., Panama, pl. xl, figs. 5 & 5a; DRUCE, p. 480, Biol. Centr. Am. Heter. i.

*Mastigophorus lygdus*, pl. xxxix, figs. 1 & 1a, *antorides*, figs. 2 & 2a, *M. (?) anthores*, fig. 3, p. 470, *lysaniax*, figs. 4 & 4a, *mallophora*, figs. 5 & 5a, *aonia*, figs. 6 & 6a, p. 471, Central America, DRUCE, Biol. Centr. Am. Heter. i : n. spp.

*Maxia*, n. g., near *Pinacia*, p. 488, for *M. decora*, n. sp., Nossi-Bé, p. 489, fig. 207; SAALMÜLLER, Lep. Madag.

*Megatomis judicatalis*, Wlk., referred to *Sorygaza* and figured; DRUCE, p. 488, pl. xli, fig. 3, Biol. Centr. Am. Heter. i.

*M. anna*, pl. xxxviii, figs. 21 & 22, *lysizona*, figs. 23 & 24, p. 467, *anthippe*, fig. 25, *antonia*, fig. 26, Central America, DRUCE, p. 468, Biol. Centr. Am. Heter. i, n. spp.

- Menecina bifacies* figured, pl. xxxvi, fig. 15 ; Biol. Centr. Am. Heter. i.
- ✓ *Myrtule*, n. g., ? near *Lametia*, for *M. imitata*, n. sp., Panama and Brazil, pl. xxxvi, figs. 6 & 7 ; DRUCE, p. 443, Biol. Centr. Am. Heter. i.
- ✓ *Narcæa*, n. g., near *Simplicia*, for *N. villosa*, n. sp., Panama, pl. xxxvi, figs. 21 & 24 ; DRUCE, p. 449, Biol. Centr. Am. Heter. i.
- ✓ *N. atrax*, Loja, DOGNIN, Le Nat. 1891, p. 126, n. sp.
- ✓ *Neohermينيا*, n. g., for a portion of *Bleptina*, Wlk. (q.v.), p. 471, and including with doubt the following n. spp. from Central America : *apsinthes*, pl. xxxix, fig. 9, *anchista*, fig. 10, *angitia*, fig. 11, p. 473 ; DRUCE, Biol. Centr. Am. Heter. i.
- ✓ *Neopalthis*, n. g., near *Palthis*, for *N. madates*, n. sp., Central America, pl. xxxix, figs. 16 & 17 ; DRUCE, p. 475, Biol. Centr. Am. Heter. i.
- ✓ *Nicetas*, n. g., *Herminiidae*, for *N. panamensis*, p. 450, pl. xxxvii, figs. 3 & 4, *annon*, fig. 5, *lycon*, fig. 6, p. 451, n. spp., Panama ; DRUCE, Biol. Centr. Am. Heter. i.
- ✓ *Oroscofa*, n. g., for *O. concha*, pl. xl, figs. 22 & 22a, *punctata*, fig. 23, n. spp., Panama ; DRUCE, p. 486, Biol. Centr. Am. Heter. i.
- ✓ *Otaces*, n. g., near *Gaberasa*, for *O. lineata*, n. sp., Panama, pl. xxxviii, figs. 16 & 16a ; DRUCE, p. 464, Biol. Centr. Am. Heter. i.
- ✓ *Parca*, n. g., *Herminiidae*, p. 486, for *P. inustata*, n. sp., Nossi-Bé, p. 487, fig. 199 ; SAALMÜLLER, Lep. Madag.
- ✓ *Periphrage mago*, pl. xxxviii, figs. 27 & 27a, p. 468, *anyte*, figs. 28 & 28a, p. 469, Mexico, DRUCE, Biol. Centr. Am. Heter. i, n. spp.
- ✓ *Plynteria*, n. g., for *P. marginata*, pl. xli, figs. 5 & 6, *lineata*, figs. 7 & 7a, n. spp., Panama ; DRUCE, p. 489, Biol. Centr. Am. Heter. i.
- ✓ *Pæna*, n. g., p. 483 ; type, *Hypena porrectalis*, Gn. ?, which is figured, pl. xl, fig. 14, and including *P. tessellata*, Costa Rica, pl. xl, fig. 15, and *P. (?) albomarginata*, Mexico, fig. 16, n. spp., p. 484 ; DRUCE, Biol. Centr. Am. Heter. i.
- ✓ *Pyrgion*, n. g., for *Bleptina menippusalis*, Wlk., which is figured, pl. xxxvii, figs. 10 & 11 ; DRUCE, p. 453, Biol. Centr. Am. Heter. i.
- ✓ *Rhescipha obtusa*, Wlk., figured, pl. xl, figs. 21 & 21a ; DRUCE, Biol. Centr. Am. Heter. i.
- ✓ *Rhynchina pallida*, pl. cxlvii, fig. 5, p. 92, *idæoides*, fig. 12, *tenuipalpis*, fig. 11, p. 93, S. India, HAMPSON, Ill. Lep. Het. viii, n. spp.
- ✓ *Rivula puncticilia*, pl. cxlviii, fig. 17, *basalis*, fig. 3, S. India, HAMPSON, p. 101, Ill. Lep. Het. viii ; *R. niphodesma*, Queensland, MEYRICK, p. 197, Tr. R. Soc. S. Austr. xiv ; *R. orobena*, Panama, pl. xxxvi, fig. 8, *maudane*, Mexico, fig. 4, DRUCE, p. 444, Biol. Centr. Am. Heter. i : n. spp.
- ✓ *Saserna*, n. g., near *Menecina*, for *S. lyde*, pl. xxxvi, figs. 10 & 11, p. 444, and *S. (?) antias*, fig. 12, *anyte*, fig. 13, *arbuscula*, fig. 14, p. 445, n. spp., Central America ; DRUCE, Biol. Centr. Am. Heter. i.
- ✓ *Simplicia aonia*, pl. xxxvi, fig. 17, *lycambes*, fig. 18, p. 447, *S. (?) lysandria*, fig. 19, *anytis*, fig. 20, *mæra*, figs. 22 & 23, p. 448, Central America, DRUCE, Biol. Centr. Am. Heter. i, n. spp.
- ✓ *Simplisia transmisau*, Madagascar, SAALMÜLLER, p. 490, fig. 200, Lep. Madag., n. sp.

*Sitophora* (?) *lyces*, Panama, DRUCE, p. 465, pl. xxxviii, figs. 17 & 17a, Biol. Centr. Am. Heter. i, n. sp.

*Sorygaza didymata*, figured, pl. xl, fig. 24, Biol. Centr. Am. Heter. i.

*S. area*, fig. 25, *mardia*, fig. 26, *arbela*, fig. 27, *armasata*, fig. 28, p. 487, *manto*, pl. xli, fig. 1, *S.* (?) *argandina*, fig. 2, *marica*, fig. 4, p. 488, Central America, DRUCE, Biol. Centr. Am. Heter. i, n. spp.

*Strathocles*, n. g., *Hermiuidæ*, p. 451, for *S. ribbei*, pl. xxxvii, figs. 7 & 8, *imitata*, fig. 9, p. 452, n. spp., Central America ; DRUCE, Biol. Centr. Am. Heter. i.

✓*Theotinus*, n. g. ; type, *Bleptina virbiusalis*, Wlk., which is figured, pl. xxxviii, fig. 1, and including *T. lycimnia*, n. sp., Mexico, pl. xxxviii, fig. 2 ; DRUCE, p. 460, Biol. Centr. Am. Heter. i.

*Torticodes alucitalis*, figured, pl. xxxviii, figs. 5 & 6, Biol. Centr. Am. Heter. i.

*T. aon*, Mexico, DRUCE, p. 461, pl. xxxviii, figs. 3 & 4, Biol. Centr. Am. Heter. i, n. sp.

*Zanclognatha relata*, S. India, HAMPSON, p. 99, pl. cxlviii, fig. 5, Ill. Lep. Het. viii, n. sp.

✓*Zorzines*, n. g., *Hermiuides*, for *Z. plumula*, n. sp., Panama, pl. xxxvi, fig. 16, DRUCE, p. 446, Biol. Centr. Am. Heter. i.

#### GEOMETRIDÆ.

[Cf. BAKER (27), BARTLETT-CALVERT (30), CALBERLA (126), DOGNIN (190, 193), DRUCE (337), GROSS (351), HABICH (366), HAMPSON (369), JOANNIS (443), LEECH (512, 515), MABILLE (551), MERRIFIELD (577), MEYRICK (531, 582, 583), OBERTHUR (629), POUJADE (665), RILEY (724), SAALMÜLLER (759), SWINHOE (851, 852), WHITE (960).]

In his revision of the Australian *Lepidoptera*, part iv, MEYRICK deals with the family *Hydriomenidæ*, formerly called *Larentiidæ* ; including in it 19 genera and 91 species.

*Abraxas grossulariata* on *Euonymus japonicus* ; DOUGLAS, Ent. M. M. (2) p. 167.

*A. germana*, S. India, SWINHOE, p. 143, Tr. E. Soc. 1891 ; *A. irrula*, pl. clii, fig. 1, *adusta*, figs. 14 & 16, p. 115, *crocearia*, figs. 17 & 18, p. 116, S. India, HAMPSON, Ill. Lep. Het. viii : n. spp.

*Acidalia agraria*, *volitaria*, Algeria, p. lxxix, *pastoraria*, Asia Minor, p. lxxx, JOANNIS, Bull. Soc. Ent. Fr. 1891 ; *A. maderæ*, p. 213, *unostrigata*, *zargi*, p. 214, *wollastoni*, *irrorata*, p. 215, Madeira, BAKER, Tr. E. Soc. 1891 ; *A. plumbearia*, Japan, LEECH, Ent. xxiv, Supp. p. 55 : n. spp.

*Acropteris luteopictata*, Laos, POUJADE, p. lxiv, Bull. Soc. Ent. Fr. 1891, n. sp.

*Æschropteryx marciana*, p. 11, pl. xlii, fig. 2, *martina*, p. 12, fig. 3, Central America, DRUCE, Biol. Centr. Am. Heter. ii, n. spp.

*A. lana albopunctata*, Khasia Hills, SWINHOE, p. 491, Tr. E. Soc. 1891, n. sp.

*Alcis nilgirica*, S. India, HAMPSON, p. 107, pl. cl, fig. 12, Ill. Lep. Het. viii, n. sp.

- Amphidasis betularia*, assembling of; COLE, *Essex Nat.* v, p. 171.
- A. invenustaria*, Japan, LEECH, *Ent.* xxiv, Supp. p. 43, n. sp.
- Andragrupes*, n. g., *Larentiidae*, near *Iramba*, for *A. violacea*, n. sp., S. India, pl. clii, figs. 15 & 16; HAMPSON, *Ill. Lep. Het.* viii.
- Anomocentris*, n. g., *Hydriomenidae*, for *A. crystallota*, n. sp., W. Australia; MEYRICK, p. 860, *P. Linn. Soc. N.S.W.* (2) v.
- Anthyperrythra*, n. g., *Ennomidae*, for *A. hermearia*, n. sp., Khasia Hills, pl. xix, fig. 9; SWINHÖE, p. 485, *Tr. E. Soc.* 1891.
- Anticlea multilinea*, S. India, HAMPSON, p. 120, pl. clii, fig. 2, *Ill. Lep. Het.* viii; *A. ? ningpoaria*, China, *grataria*, Japan, LEECH, *Ent.* xxiv, Supp. p. 52 : n. spp.
- Apocheima albofasciaria*, Japan, LEECH, *Ent.* xxiv, Supp. p. 48, n. sp.
- Arichanna albomacularia*, *pryeraria*, Japan, LEECH, *Ent.* xxiv, Supp. p. 51, n. spp.
- Aspilates niveipennaria*, Maas., referred to *Venodes*; SNELLEN, p. 191, *Tijdschr. Ent.* xxxiv.
- Asthenia maculifascia*, S. India, HAMPSON, p. 125, pl. cliii, fig. 5, *Ill. Lep. Het.* viii; *A. urarcha*, Tasmania, p. 812, *thalassias*, Queensland, p. 813, *xylocyma*, p. 814, *scoliata*, W. Australia, *euphylla*, Tasmania, p. 815, *oceanias*, W. Australia, *anthodes*, Sydney, p. 816, MEYRICK, *P. Linn. Soc. N.S.W.* (2) v : n. spp.
- Azata subfasciata*, pl. cli, fig. 20, p. 112, *A. ? emarginata*, fig. 14, *palliatata*, figs. 5 & 11, p. 113, *excisa*, fig. 13, p. 114, S. India, HAMPSON, *Ill. Lep. Het.* viii, n. spp.
- Azelina snelleni*, = (*caninata*, Sn., nec Gn.) ; DRUCE, p. 22, *Biol. Centr. Am. Heter.* ii, n. sp.
- Biston zonarius*, habits of larva; JUNGE, p. 50, *Verh. Ver. Hamb.* vii.
- B. plumosaria*, Japan, LEECH, *Ent.* xxiv, Supp. p. 43, n. sp.
- Boarmia rudiata*, Wlk. (as *Cidaria rudisata*), = (*astrapia*, Meyr.) ; *B. lupinata* and *suavis*, notes on; MEYRICK, p. 101, *Tr. N. Z. Inst.* xxiii.
- B. wollastoni*, Madeira, BAKER, p. 217, pl. xii, fig. 7, *Tr. E. Soc.* 1891; *B. (Burichura) leucopterata*, Laos, POUJADE, p. lxiv, *Bull. Soc. Ent. Fr.* 1891; *B. fumosaria*, *venustaria*, Japan, *corearia*, Korea, p. 44, *fuscomarginaria*, *fuscaria*, *ornataria*, p. 45, *basifuscaria*, Japan, *appositaria*, Gensan, p. 46, *sinuosaria*, China, *flavolinearia*, Japan, p. 47, LEECH, *Ent.* xxiv, Supp. : n. spp.
- Brotis studiosa*, Loja, DOGNIN, *Le Nat.* 1891, p. 278, n. sp.
- Byssodes mollita*, Venezuela, DOGNIN, p. clvii, *Bull. Soc. Ent. Fr.* 1891, n. sp.
- Caberodes erythra*, S. India, HAMPSON, p. 104, pl. cl, fig. 2, *Ill. Lep. Het.* viii, n. sp.
- Carige rachitaria*, Khasia Hills, SWINHÖE, p. 492, *Tr. E. Soc.* 1891, n. sp.
- Carphoxera*, n. g., *Acidaliinae*, for *C. ptelearia*, n. sp., N. America; RILEY, pp. 108-113, figs. 6, 7, & 11, *Ins. Life*, iv. This insect is destructive in herbaria.

*Cerysia*, n. g., to be placed near *Pasitheia*, Meyr., for *Scordylia chrysop-terata*, Sn., and possibly including *Psodos gemina*, *splendens*, *delicatula*, Maas.; SNELLEN, p. 190, Tijdschr. Ent. xxxiv.

*Chondrosoma arcanaria*, Mill., ♀ and larva noticed; CHRÉTIEN, p. cxxxvi, Bull. Soc. Ent. Fr. 1891.

*Cidaria salicata*, Hb., natural history of; FUCHS, pp. 229–236, JB. nass. Ver. xlv. *C. variata*, metamorphoses and varieties figured; SEPP, Nederl. Ins. (2) iv, pl. xxxi, pp. 163–170. *C. salicata*, metamorphoses; GROSS, p. 355, S. E. Z. 1891. *C. russata* and *immanata*, distinctive characters, discussion, with figs.; Ent. Rec. i, pp. 274–278.

*C. callidaria*, Beyrout, JOANNIS, p. lxxxii, Bull. Soc. Ent. Fr. 1891; *C. fecunda*, *scortea*, p. 493, *furva*, p. 494, Khasia Hills, SWINHÖE, Tr. E. Soc. 1891; *C. fumipennis*, pl. clii, fig. 7, *albilinea*, fig. 9, p. 120, *subapicalis*, pl. cliii, fig. 1, *multilineata*, fig. 8, p. 121, S. India, HAMPSON, Ill. Lep. Het. viii; *C. pallidaria*, *prattiaria*, p. 52, *parvaria*, *C. ? debilitata*, Japan, p. 53, LEECH, Ent. xxiv, Supp.; *C. samanigoi*, Loja; DOGNIN, p. 126, Le Nat. 1891 : n. spp.

*Cimicodes primularia*, Centr. and S. America, DRUCE, p. 18, pl. xlii, fig. 21, Biol. Centr. Am. Heter. ii, n. sp.

*Cirsodes acuminata*, figured, pl. xlii, fig. 5, Biol. Centr. Am. Heter. ii.

*C. arceno*, Mexico, p. 13, pl. xlii, fig. 4, DRUCE, Biol. Centr. Am. Heter. ii, n. sp.

*C. nebulosa*, Khasia Hills, SWINHÖE, p. 488, Tr. E. Soc. 1891; *C. indistincta*, pl. cli, fig. 3, *latifascia*, fig. 4, S. India, HAMPSON, p. 106, Ill. Lep. Het. viii : n. spp.

*Collix lentiginosaria*, Japan, LEECH, Ent. xxiv, Supp. p. 55; *C. suffusa*, p. cliii, figs. 15 & 23, *leprosa*, figs. 2 & 9, S. India, HAMPSON, p. 122, Ill. Lep. Het. viii : n. spp.

*Comibena alboviridata*, figured, and referred to *Phorodesma*; SAALMÜLLER, fig. 271, p. 495, Lep. Madag.

*Coremia centro-strigaria*, Woll., figured, pl. xii, fig. 9, Tr. E. Soc. 1891.

*Corymica exiguinota*, S. India, HAMPSON, p. 114, pl. cli, fig. 12, Ill. Lep. Het. viii; *C. gensanaria*, Corea, LEECH, Ent. xxiv, Supp. p. 56 : n. spp.

*Craspedia linearis*, pl. cliii, fig. 13, *latimarginaria*, fig. 6, S. India, HAMPSON, p. 123, Ill. Lep. Het. viii, n. spp.

*Crociniis piperata*, Saalm., referred to *Gynopteryx*; SAALMÜLLER, p. 494, Lep. Madag.

*Digonis philippii*, Araucania, BARTLETT-CALVERT, Ent. M. M. (2) ii, p. 314, n. sp. (but see Zool. Rec. xxvii).

*Dindica para*, Khasia Hills, SWINHÖE, p. 490, Tr. E. Soc. 1891, n. sp.

*Ennomos autumnaria*, experiments on influence of temperature during pupal stage on colour and markings; MERRIFIELD (577).

*Ephyra rubra*, pl. cli, fig. 8, *maculifascia*, fig. 9, S. India, HAMPSON, p. 111, Ill. Lep. Het. viii, n. spp.

*Epimecis medinæ*, Valdivia, BARTLETT-CALVERT, Ent. M. M. (2) ii, p. 314, n. sp. (but see Zool. Rec. xxvii).

*Eubolia rupicola*, Woll., figured, pl. xii, fig. 8, Tr. E. Soc. 1891.

*Euchoeca*, Hb., adopted for *Ptychopoda rubropunctaria*, Dbld.; MEYRICK, p. 811, P. Linn. Soc. N.S.W. (2) v.

*Eucrostis smaragdus*, S. India, HAMPSON, p. 110, pl. cli, fig. 15, Ill. Lep. Het. viii, n. sp.

*Eumelia olivacea*, S. India, HAMPSON, p. 111, pl. cli, fig. 17, Ill. Lep. Het. viii, n. sp.

*Eupithecia*: structure of the terminal segment of male; WHITE, Ent. xxiv, p. 129, pls. i & ii: larvæ, their colour influenced by food; HABICH, S. E. Z. 1891, p. 36. *E. cochata*, n. n. for *cidariata*, Maas., nec Gn.; SNELLEN, p. 191, Tijdschr. Ent. xxxiv. *E. satyrata*, metamorphoses figured and described; SEPP, Nederl. Ins. (2) iv, pp. 181-187, pl. xxxiii.

*E. illuminata*, Algeria, p. lxxx, *albosparsata*, Asia Minor, p. lxxxi, JOANNIS, Bull. Soc. Ent. Fr. 1891; *E. annulata*, pl. clii, fig. 11, p. 116, *variegata*, fig. 24, *dentifascia*, fig. 12, *asema*, fig. 23, p. 117, *fasciata*, fig. 22, *deleta*, fig. 20, *ectochloros*, fig. 19, *bifasciata*, fig. 13, p. 118, S. India, HAMPSON, Ill. Lep. Het. viii: n. spp.

*Fidonia lafayi*, Dogn., = (*auripunctaria*, Maas.), p. 61; *riofrio*, Dogn., = (*argentilinearia*, Maas.), p. 62; DOGNIN, Lep. Loja.

*F. lutearia*, Japan, LEECH, Ent. xxiv, Supp. p. 50, n. sp.

*Ganoruna nigripuncta*, S. India, HAMPSON, p. 114, pl. cli, fig. 18, Ill. Lep. Het. viii, n. sp.

*Geometra pallescens*, S. India, HAMPSON, p. 108, pl. cli, fig. 3, Ill. Lep. Het. viii, n. sp.

*Gnophos palæstinensis*, Palestine, CALBERLA, Deutsche e. Z. Lep. iv, p. 51, *G. philolaches*, pl. iii, fig. 26, *theuropides*, fig. 28, Ta-Tsien-Lou, OBERTHUR, p. 22, Études d'Ent. xv: n. spp.

*Gonodela triangulata*, S. India, HAMPSON, p. 112, pl. cli, figs. 4 & 10, Ill. Lep. Het. viii, n. sp.

*Gymnoscelis bicoloria*, Madeira, BAKER, p. 220, Tr. E. Soc. 1891, n. sp.

*Halia fuscaria*, Japan, *corearia*, Gensan, LEECH, Ent. xxiv, Supp. p. 50, n. spp.

*Hemerophila tetragraphicata*, Saalm., figured, p. 274, and referred to *Macaria*, p. 497; SAALMÜLLER, Lep. Madag.

*H. maderæ*, Madeira, BAKER, p. 216, pl. xii, fig. 6, Tr. E. Soc. 1891, n. sp.

*Herbita artayctes*, pl. xliii, figs. 5 & 6, *medama*, figs. 7 & 8, Central America, DRUCE, p. 24, Biol. Centr. Am. Heter. ii, n. spp.

†*Heterochasta*, n. g., for *Ciduria conglobata*, Wlk.; MEYRICK, p. 808, P. Linn. Soc. N.S.W. (2) v.

*Heterolocha rumiaria*, Gn., = (*inquietaria*, Maas.); SNELLEN, p. 189, Tijdschr. Ent. xxxiv.

*Hezeris trizonata*, figured, fig. 278 (given as n. g. & sp. on p. 498, but without description); SAALMÜLLER, Lep. Madag.

*Hybernia defoliaria* and *aurantiaria*, migrations of males; HONRATH, B. E. Z. xxxvi, p. ix, SB.

*Hydriomena phædra*, Sydney, p. 824, *rhynchota*, p. 826, *symphona*, p. 832, *cataphæa*, Mt. Kosciusko, *lamprotis*, p. 833, N. S. Wales, *synchora*, Tasmania, p. 835, *aglaodes*, p. 836, *heteroleuca*, p. 837, Mt. Kosciusko, *doliopis*,



Mt. Lofly, p. 838, *orthropis*, Mt. Kosciusko, *microcyma*, Tasmania, p. 840, *polycarpa*, p. 841, *oxygona*, p. 842, *stereozone*, *chrysocyma*, p. 843, *leucozona*, p. 846, *polyxantha*, p. 847, Mt. Kosciusko, *trygodes*, Tasmania, p. 851, *cryeropa*, N. S. Wales, p. 853, *leucophanes*, Tasmania, p. 856, MEYRICK, P. Linn. Soc. N.S.W. (2) v, n. spp.

*Hyperythra phœnix*, Khasia Hills, SWINHOE, p. 484, Tr. E. Soc. 1891 ; *H. rufofasciata*, Laos, POUJADE, p. lxv, Bull. Soc. Ent. Fr. 1891 : n. spp.

*Hypochrosis intexta*, S. India, SWINHOE, p. 145, pl. viii, fig. 11, Tr. E. Soc. 1891, n. sp.

*Hypsipetes ruberata*, life history ; RICHARDSON, Ent. M. M. (2) ii, pp. 296-298.

*Hyria vinacea*, pl. cliii, fig. 4, *griseipennis*, fig. 11, *pulchella*, fig. 22, S. India, HAMPSON, p. 124, Ill. Lep. Het. viii, n. spp.

*Idea ocheracea*, S. India, HAMPSON, p. 122, pl. cliii, fig. 3, Ill. Lep. Het. viii, n. sp.

*Krananda latimarginaria*, Japan, LEECH, Ent. xxiv, Supp. p. 56, n. sp.

*Larentia brumata*, ravages in Normandy ; HUET & LOUISE, Bull. Soc. L. Norm. (4) v, pp. 15-19. *L. didymata*, food-plant ; VAUGHAN, Ent. xxiv, p. 245.

*Lobophora grisearia*, *consobrinaria*, *bellaria*, p. 54, Japan, *obscuraria*, Japan and Loochoo Is., p. 55, LEECH, Ent. xxiv, Supp., n. spp.

† *Lophophleps*, n. g., *Idæidæ*, for *L. purpurea*, n. sp., S. India, pl. cliii, fig. 12 ; HAMPSON, p. 125, Ill. Lep. Het. viii.

*Lozogramma* (?) *bilineata*, Gifu, LEECH, Ent. xxiv, Supp. p. 48, n. sp.

*Luziaria hypaphanes*, S. India, HAMPSON, p. 125, pl. cliii, figs. 7 & 14, Ill. Lep. Het. viii, n. sp.

*Lycimna* (sub *Azelina*) *caninata*, Gn., figured, pl. xliii, figs. 1 & 2 ; Biol. Centr. Am. Heter. ii.

*L. matalia*, p. 22, pl. xliii, fig. 3, *artena*, p. 23, pl. xliii, fig. 4, Central America, DRUCE, Biol. Centr. Am. Heter. ii, n. spp.

*Macaria temeraria*, Khasia Hills, SWINHOE, p. 492, Tr. E. Soc. 1891 ; *M. cacularia*, Ta-Tsien-Lou, OBERTHUR, p. 24, pl. iii, fig. 32, Études d'Ent. xv : n. spp.

*Marcata varians*, Khasia Hills, SWINHOE, p. 487, Tr. E. Soc. 1891, n. sp.

*Medasina plumosa*, S. India, HAMPSON, p. 105, pl. cl, fig. 1, Ill. Lep. Het. viii, n. sp.

*Melanippe fluctuata* var. *neapolisata* noticed ; REID, Ent. xxiv, p. 75.

*Melanthia latifasciaria*, Japan, LEECH, Ent. xxiv, Supp. p. 53, n. sp.

† *Melitulias*, n. g., p. 857, for *M. discophora*, n. sp., Mt. Kosciusko, p. 859, including *Phibalapteryx glandulata*, Gn., and *Tephрина graphicata*, Wlk. ; MEYRICK, P. Linn. Soc. N.S.W. (2) v.

*Menophra nigrifasciata*, p. 105, pl. cl, fig. 1, *rubridisca*, fig. 8, p. 106, S. India, HAMPSON, Ill. Lep. Het. viii, n. spp.

† (*Mesoptila*, n. g., *Hydriomenidæ*, for *M. compsodes*, n. sp., Sydney ; MEYRICK, p. 794, P. Linn. Soc. N.S.W. (2) v.

*Mesotype virgata*, metamorphoses described and figured ; SEPP, Nederl. Ins. (2) iv, pp. 205-210, pl. xxxviii.

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*Microdes melanocausta*, Tasmania, MEYRICK, P. Linn. Soc. N.S.W. (2) v, p. 803, n. sp.

*Miconia archilis*, Ta-Tsien-Lou, OBERTHUR, p. 23, pl. iii, fig. 33, *Études d'Ent.* xv, n. sp.

*Microniodes*, Maas., note on its systematic position; SNELLEN, p. 190, *Tijdschr. Ent.* xxxiv.

*Micronissa*, n. g., for *Urapteryx margitata*, Moore; SWINHOE, p. 483, *Tr. E. Soc.* 1891.

*Mucronodes artemon*, Mexico, DRUCE, pl. xlii, fig. 20, p. 17, *Biol. Centr. Am. Heter.* ii, n. sp.

*Nadagra punctilinearia*, Japan, LEECH, *Ent.* xxiv, Supp. p. 55, n. sp.

*Narapa pallida*, S. India, HAMPSON, p. 106, pl. cl, fig. 9, *Ill. Lep. Het.* viii, n. sp.

*Nemoria nubigena*, Woll., note on; BAKER, p. 212, *Tr. E. Soc.* 1891.

*Nepheloleuca ardanía*, Panama, DRUCE, p. 10, pl. xlii, fig. 1, *Biol. Centr. Am. Heter.* ii, n. sp.

*Nolera melanthiata*, Gaboon, MABILLE, p. cxxvii, *Bull. Soc. Ent. Fr.* 1891, n. sp.

*Obrussa catenata*, figured, fig. 268 (given as n. g. & sp. on p. 498, but without description); SAALMÜLLER, *Lep. Madag.*

*Odontopera nemea*, Khasia Hills, SWINHOE, p. 485, pl. xix, fig. 5, *Tr. E. Soc.* 1891, n. sp.

*Ophthalmodes minutaria*, Loo Choo Is., LEECH, *Ent.* xxiv, Supp. p. 43; *O. pulsaria*, *lectularia*, E. India, pl. xix, fig. 4, SWINHOE, p. 489, *Tr. E. Soc.* 1891 : n. spp.

*Oporabia japonaria*, Yokohama, LEECH, *Ent.* xxiv, Supp. p. 48; *O. ? arenosa*, Coquimbo, BARTLETT-CALVERT, *Ent. M. M.* (2) ii, p. 313, n. sp. (but cf. *Zool. Rec.* xxvii) : n. spp.

*Oxydia recurvaria*, H. S., var. = (*geminata*, Maas.); SNELLEN, p. 189, *Tijdschr. Ent.* xxxiv.

*O. herbertina*, Ecuador, DOGNIN, p. clvii, *Bull. Soc. Ent. Fr.* 1891, n. sp.

*Pachyodes ruficosta*, S. India, HAMPSON, p. 108, pl. cl, fig. 16, *Ill. Lep. Het.* viii, n. sp.

*Paragonia arbocala*, Mexico, DRUCE, p. 20, pl. xlii, fig. 22, *Biol. Centr. Am. Heter.* ii, n. sp.

*Pasiphila dryas*, New Zealand, MEYRICK, p. 97, *Tr. N. Z. Inst.* xxiii, n. sp.

*Pellonia vibicaria*, metamorphoses described and figured; SEPP, *Nederl. Ins.* (2) iv, pp. 197-202, pls. xxxv & xxxvi.

*Phasiane incertaria*, *albifrontaria*, Japan, LEECH, *Ent.* xxiv, Supp. p. 49, n. spp.

*Phigalia pilosaria*, black var.; FOWLER, *Ent. M. M.* (2) ii, p. 110.

*Phrissogonus catastreptes*, p. 797, *pyretodes*, p. 799, Sydney, MEYRICK, P. Linn. Soc. N.S.W. (2) v, n. spp.

*Pingasa alba*, Khasia Hills, SWINHOE, p. 491, pl. xix, fig. 6, *Tr. E. Soc.* 1891, n. sp.

*Plutodes nilgirica*, S. India, HAMPSON, p. 115, pl. cli, fig. 6, Ill. Lep. Het. viii, n. sp.

*Prionia rosearia*, China, LEECH, Ent. xxiv, Supp. p. 56, n. sp.

*Procherodes* (sub *Clysia*) *columbipennis*, Wlk., figured, pl. xlii, fig. 24, Biol. Centr. Am. Heter. ii.

*P. arrhapa*, Central America, DRUCE, p. 21, pl. xlii, fig. 23, Biol. Centr. Am. Heter. ii, n. sp.

<sup>1</sup>*Protaulaca*, n. g., *Hydriomenidæ*, for *P. scythropa*, n. sp., Australia; MEYRICK, p. 810, P. Linn. Soc. N.S.W. (2) v.

*Pseudasthena permutans*, S. India, HAMPSON, p. 123, pl. cliii, figs. 17-21, Ill. Lep. Het. viii, n. sp.

<sup>4</sup>*Psilocerea*, n. g., *Ennomidæ*, for *P. tigrinata*, n. sp., Nossi-Bé; SAAL-MÜLLER, p. 493, Lep. Madag.

*Psodos gemina*, *splendens*, *delicatula*, Maas., generic position queried; SNELLEN, p. 189, Tijdschr. Ent. xxxiv. (Cf. *Cerysia*, p. 239.)

*Remodes melanocera*, S. India, HAMPSON, p. 119, pl. clii, fig. 10, Ill. Lep. Het. viii; *R. malaca*, Queensland, p. 804, *lichenias*, Sydney, p. 805, MEYRICK, P. Linn. Soc. N.S.W. (2) v : n. spp.

*Sabulodes dosilheata*, Gn., = (*combustaria*, Maas.), *rusticata*, Maas., referred to *Cimicodes*; SNELLEN, p. 188, Tijdschr. Ent. xxxiv.

*S. proximata*, Loja, Dognin, Le Nat. 1891, p. 223; *S. arge*, p. 13, pl. xlii, fig. 6, *argyra*, figs. 7 & 8, *arses*, figs. 11-13, *mastaura*, figs. 9 & 10, p. 14, *matrona*, fig. 14, *meduana*, fig. 15, *arnissa*, figs. 16-18, p. 15, *matrica*, fig. 19, p. 16, Central America, DRUCE, Biol. Centr. Am. Heter. ii : n. spp.

*Sarcinodes susana*, Khasia Hills, SWINHOE, p. 488, Tr. E. Soc. 1891 : n. sp.

*Scordylia gratulata*, Gn., = (*Trochiodes melaleucata*, Maas.) ; SNELLEN, p. 191, Tijdschr. Ent. xxxiv.

*S. oxyntis*, p. 817, *leucophragma*, p. 818, Melbourne, MEYRICK, P. Linn. Soc. N.S.W. (2) v, n. spp.

*Scotopteryx*? *graphica*, Chili, BARTLETT-CALVERT, Ent. M. M. (2) ii, p. 315, n. sp. (but cf. Zool. Rec. xxvii).

*Scotosia flavolimbaria*, Maas., referred to *Spargania*, Gn.; SNELLEN, p. 191, Tijdschr. Ent. xxxiv. *S. rhamnata*, n. var., *japanaria*; LEECH, Ent. xxiv, Supp. p. 53.

*S. punctimarginaria*, *umbraria*, Japan, LEECH, Ent. xxiv, Supp. p. 53; *S. fuliginea*, S. India, HAMPSON, p. 120, pl. clii, fig. 4, Ill. Lep. Het. viii : n. spp.

*Selenia illustraria*: experiments on changes of colour by temperature during pupal stage; MERRIFIELD (577).

*S. codra*, p. 486, pl. xix, fig. 8, *murina*, p. 487, fig. 13, Khasia Hills, SWINHOE, Tr. E. Soc. 1891; *S. adustaria*, p. 42, *pallidaria*, p. 43, Japan, LEECH, Ent. xxiv, Supp. : n. spp.

*Serraca transcissa*, Walk., figured, pl. cl, fig. 6, ♀ described, p. 107; HAMPSON, Ill. Lep. Het. viii.

*Siona triangularia*, Punta Arenas, BARTLETT-CALVERT, Ent. M. M. (2) ii, p. 313, n. sp.

- Tacparia pryeraria*, Japan, LEECH, Ent. xxiv, Supp. p. 56, n. sp.  
*Tephрина* ? *fumosa*, S. India, HAMPSON, p. 112, pl. cli, fig. 19, Ill. Lep. Het. viii, n. sp.  
*Tephrosia angulata*, S. India, HAMPSON, p. 107, pl. cl, fig. 7, Ill. Lep. Het. viii ; *T. costipunctaria*, *parvularia*, Japan, LEECH, Ent. xxiv, Supp. p. 47 : n. spp.  
*Tetracis ianthinus*, Araucania, BARTLETT-CALVERT, Ent. M. M. (2) ii, p. 312, n. sp. (but cf. Zool. Rec. xxvii).  
*Thalassodes melica*, S. India, SWINHOE, p. 144, Tr. E. Soc. 1891, n. sp.  
*Thalera aculeata*, pl. cl, fig. 5, *graminea*, pl. cli, fig. 1, *undularia*, fig. 2, p. 109, *unifascia*, fig. 7, *uniformis*, pl. cl, fig. 11, S. India, HAMPSON, Ill. Lep. Het. viii, n. spp.  
<sup>1</sup>*Traminda*, n. g., for *Timandra decessata*, Saalm., figured, fig. 262 ; SAALMÜLLER, p. 496, Lep. Madag.  
*Urapteryx marginata*, S. India, HAMPSON, p. 104, pl. cl, fig. 17, Ill. Lep. Het. viii ; *U. nigrociliaris*, *parallelaria*, China, LEECH, Ent. xxiv, Supp. p. 5 ; *U. subpunctaria*, Japan, LEECH, t. c. Supp. p. 42 ; *U. reymoneta*, Ecuador, DOGNIN, p. clvi, Bull. Soc. Ent. Fr. 1891 : n. spp.  
<sup>1</sup>*Urostola*, n. g. ; type of a new family (*Urostolidæ*) related to the ancestral form of the *Boarmiidae*, for *U. magica*, n. sp., Queensland ; MEYRICK, Tr. R. Soc. S. Austr. xiv.  
*Venusia chrysocilia*, S. India, HAMPSON, p. 124, pl. cliii, fig. 16, Ill. Lep. Het. viii, n. sp.  
*Xanthorhoe centroneura*, Tasmania, p. 863, *argodesma*, Melbourne, p. 867, *anaspila*, N. S. W., p. 869, *xerodes*, W. Australia, p. 870, *epicrossa*, p. 871, *nephodes*, p. 874, S. Australia, MEYRICK, P. Linn. Soc. N. S. W. (2) v, n. spp.  
*Ypsipetes simulator*, Loja, DOGNIN, p. 279, Le Nat. 1891, n. sp.  
*Zumarada excisa*, S. India, HAMPSON, p. 110, Ill. Lep. Het. viii, n. sp.  
*Zerene catenaria*, early stages of ; SCUDDER, Psyche, vi, p. 124.  
*Zomia miscella*, S. India, SWINHOE, p. 144, Tr. E. Soc. 1891, n. sp.  
*Zonosoma (Ephyra) pupillaria*, var. noticed ; BAKER, p. 215, Tr. E. Soc. 1891.  
*Z. (Ephyra) maderensis*, Madeira, BAKER, p. 216, pl. xii, fig. 5, Tr. E. Soc. 1891, n. sp.

PYRALIDÆ, PHYCITIDÆ, SICULODIDÆ, EPIPASCHIDÆ, CRAMBIDÆ.

[Cf. CHRÉTIEN (149), COTES (162), DOGNIN (191, 196), FERNALD (279), HAMPSON (369), HERING (387, 388), HINNEBERG (393), JOANNIS (443), MEYRICK (585), OBERTHUR (629), RAGONOT (680, 681), REBEL (685, 686), SAALMÜLLER (759), SNELLEN (829), SWINHOE (851), WARREN (925).]

Classification of the subfam. *Pyralidinae*, with tabulation of the characters of the genera ; RAGONOT, Ann. Soc. Ent. Fr. 1891, pp. 13, &c.

Meyrick's classification reviewed and criticised ; REBEL & HERING, S. E. Z. 1891, pp. 103-128.

WARREN, Ent. xxiv, pp. 180-185, gives much synonymy, without indicating which of it is new : the larger part is given in detail below.

*Achræa grisella*, odour of ♂ ; HINNEBERG, p. 74, S. E. Z. 1891.

*Actenioides fuscalis*, S. India, HAMPSON, p. 128, pl. cliv, fig. 5, Ill. Lep. Het. viii, n. sp.

✓*Adulis*, n. g., for *A. serratalis*, W. Africa, p. 45, *distrigalis*, S. America? p. 46, n. spp. ; RAGONOT, Ann. Soc. Ent. Fr. 1891.

*Aglossa maceralis*, Syria, CHRÉTIEN, Le Nat. 1891, p. 67, n. sp.

✓*Aglossodes*, n. g., p. 62, for *A. prionophoralis*, n. sp., Natal, p. 63 ; RAGONOT, Ann. Soc. Ent. Fr. 1891.

*Agrotera basinotata*, E. India, HAMPSON, p. 137, pl. clv, fig. 13, Ill. Lep. Het. viii, n. sp.

*Anarmodia longinqualis*, Led., = (*Acrospila phellinoïdalis*, Maas.) ; SNELLEN, p. 191, Tijdschr. Ent. xxxiv.

✓*Angenora*, n. g., for *A. actenialis*, n. sp., Natal ; RAGONOT, p. 80, Ann. Soc. Ent. Fr. 1891 (cf. *Zitha*, *infra*).

*Aphyloceros vagans*, England, TUTT, Ent. Rec. i, p. 203, n. sp.

*Aplomastix mimula*, pl. clv, fig. 23, *ustalis*, fig. 7, S. India, HAMPSON, p. 138, Ill. Lep. Het. viii, n. spp.

*Apphadana*, n. sp., cf. *Noctuidæ*.

*Argyria nigricosta*, S. India, HAMPSON, p. 143, pl. clvi, fig. 22, Ill. Lep. Het. viii, n. sp.

✓*Arispe*, n. g., p. 53, for *A. concretalis*, p. 54, *ovalis*, p. 55, n. spp., Sonora ; RAGONOT, Ann. Soc. Ent. Fr. 1891.

✓*Arsenaria*, n. n., to replace *Libya*, Rag. ; RAGONOT, p. 64, Ann. Soc. Ent. Fr. 1891.

*Arta rubricalis*, S. Paolo, WARREN, p. 498, Ann. N. H. (6) vii, n. sp.

*Asopia costalis*, damage by larva in N. America, habits, &c. ; WEBSTER, Ins. Life, iii, p. 121.

*Azamora*, Wlk., = (*Thylacophora*, Rag.) ; RAGONOT, p. 601, Ann. Soc. Ent. Fr. 1891.

*Balanotis exvinacea*, S. India, HAMPSON, p. 127, pl. cliv, fig. 9, Ill. Lep. Het. viii, n. sp.

✓*Baniura*, n. g., for *Constantia syrticolalis*, Rag. ; RAGONOT, p. 63, Ann. Soc. Ent. Fr. 1891.

*Blepharocerus* (?) *cinerosus*, p. 494, *sabulosus*, p. 495, Chili, WARREN, Ann. N. H. (6) vii, n. spp.

*Blepharucha zaide*, Stoll., = (*Argyphora zaidaria*, Gn., = *Botys cruo-ralis*, Zell., = *Scop. dilaceratalis*, Wlk.) ; *B.* (sub *Botys plumbatalis*, Zell., = *plumbofascialis*, Wlk., = *Scop. ferriscriptalis*, Wlk.) ; WARREN, Ent. xxiv, p. 181.

*Boreophila commistalis*, Wlk., = (*Crambus indotatellus*, Wlk., = *Botys septentrionalis*, Tgstr.), p. 181 ; *B. frustalis*, Zell., = (*Eurycreon leuco-stictalis*, Zell., p. 182 ; WARREN, Ent. xxiv.

*Botys sexpunctalis*, Chantilly, CHRÉTIEN, Le Nat. 1891, p. 67 ; *B. commellalis*, Chantilly, *id. t. c.* p. 99 ; *B. silvalis*, Asia Minor, JOANNIS,

p. lxxxii, Bull. Soc. Ent. Fr. 1891 ; *B. callidoralis*, Ta-Tsien-Lou, OBERTHUR, p. 25, pl. iii, fig. 30, Études d'Ent. xv : n. spp.

*Carcha*, Wlk., (= *Caeloma*, Moesch.) ; RAGONOT, p. 600, Ann. Soc. Ent. Fr. 1891.

*Cataclysta trimacula*, p. 139, pl. clv, fig. 14, *junctalis*, p. 140, fig. 24, S. India, HAMPSON, Ill. Lep. Het. viii, n. spp.

↓ *Catocrocis*, n. g., p. 107, for *C. lithosialis*, n. sp., Brazil, p. 108 ; RAGONOT, Ann. Soc. Ent. Fr. 1891.

*Chrysauge latifusciata*, hab. ?, *catenulata*, S. America, WARREN, p. 423, Ann. N. H. (6) vii, n. spp.

*Chrysauginae* : amended table of genera ; RAGONOT, pp. 690-692, Ann. Soc. Ent. Fr. 1891.

*Chrysophila basilinealis*, Espiritu Santo, WARREN, p. 423, Ann. N. H. (6) vii, n. sp.

*Circobotys marginalis*, pl. clv, figs. 1 & 9, *fuscalis*, pl. cliv, fig. 14, S. India, HAMPSON, p. 133, Ill. Lep. Het. viii, n. spp.

*Cirrochrista bracteolalis*, pl. clv, fig. 3, *diaphana*, fig. 11, S. India, HAMPSON, p. 135, Ill. Lep. Het. viii, n. spp.

*Cledeobia turanica*, Turan, p. 93, *draconalis*, Borneo, p. 94, RAGONOT, Ann. Soc. Ent. Fr. 1891.

*Ctenodonus rotundinidus*, S. India, HAMPSON, p. 127, pl. cliv, fig. 16, Ill. Lep. Het. viii, n. sp.

↓ *Comaria*, n. g., near *Philotis*, for *Stemmatophora castanoptera*, Moore, *Pyralis xylinalis*, Swinh., and *Pindictoria zeuxoalis*, Wlk. ; RAGONOT, p. 639, Ann. Soc. Ent. Fr. 1891.

*Condylolomia dubia*, Rio Janeiro, WARREN, p. 495, Ann. N. H. (6) vii, n. sp.

*Condylorrhiza* (sub *Botyodes*) *vestigialis*, Gn., (= *illutalis*, Gn., = *Botys tritealis* and *mestoralis*, Wlk.) ; WARREN, Ent. xxiv, p. 184.

*Crambus contaminellus*, *salinellus*, notes on, with synonymy ; REBEL, pp. 613 & 614, Verh. z.-b. Wien, xli.

↓ *Crocalia*, n. g., near *Aglossa*, p. 634, for *C. aglossalis*, n. sp., E. India, p. 635 ; RAGONOT, Ann. Soc. Ent. Fr. 1891.

*Crocidolomia binotalis*, Zell., (= *Pionea comalis* and *incomalis*, Gn.) ; WARREN, Ent. xxiv, p. 185.

*Crocidophora griseifusa*, S. India, SWINHAE, p. 153, Tr. E. Soc. 1891, n. sp.

↓ *Ctenarthria*, n. g., p. 66, for *C. khorgosalis*, n. sp., Kuldja, p. 67 ; RAGONOT, Ann. Soc. Ent. Fr. 1891.

*Dastira sublittoralis*, p. 424, *imitatrix*, p. 425, Espiritu Santo, WARREN, Ann. N. H. (6) vii, n. spp.

*Dattinia subochrealis*, p. 60, *staudingeralis*, p. 61, Biskra, RAGONOT, Ann. Soc. Ent. Fr. 1891.

*Deuterollyta variegata*, Rio Janeiro, WARREN, p. 433, Ann. N. H. (6) vii, n. sp.

*Diatraea saccharalis*, habits, life-history, &c. ; HOWARD, Ins. Life, iv, pp. 95-103, figs. 2-4.

*Dicymolomia diminutalis*, Callao, WARREN, p. 65, Ann. N. H. (6) viii, n. sp.

*Dodanga cristata*, S. India, HAMPSON, p. 136, pl. clvi, fig. 7, Ill. Lep. Het. viii, n. sp.

†*Dolichomia*, n. subg. of *Orthopygia*; RAGONOT, p. 32, Ann. Soc. Ent. Fr. 1891.

*Dolichosticha latimarginalis*, p. 138, pl. clv, fig. 15, *bilinealis*, p. 139, fig. 25, S. India, HAMPSON, Ill. Lep. Het. viii, n. spp.

†*Drepanodia*, n. g. (*Chrysauginæ*), p. 616, for *D. xerophyllalis*, n. sp., Brazil, p. 617; RAGONOT, Ann. Soc. Ent. Fr. 1891.

†*Dyspyralis*, n. g., for *D. illocata*, n. sp. (without locality); WARREN, p. 64, Ann. N. H. (6) viii.

*Ebulea fumalis*, Gn., = (*Scopula orasusalis*, Wlk., = *Botis badipennis*, Grote); WARREN, Ent. xxiv, p. 185.

†*Elicia*, n. g., near *Tretopteryx*, for *Cledeobia malgassalis*, Saal.; RAGONOT, p. 644, Ann. Soc. Ent. Fr. 1891.

*Ephestia kuhniella*, injuries, &c.: ORMEROD, Rep. 1890, pp. 52-60. *E. elutella* var. = (*roxburghii*, Gregson); BARRETT, Ent. M. M. (2) ii, p. 49.

*Epicorsia mellinalis*, Hb., = (*Botys ædipodalis*, Gn., and *butyroza*, Butl.); WARREN, Ent. xxiv, p. 185.

†*Epidelia*, n. g., p. 100, for *E. viridialis*, n. sp., Chiriqui, p. 101; RAGONOT, Ann. Soc. Ent. Fr. 1891.

†*Episindris*, n. g., p. 112, for *E. albimaculalis*, n. sp., Lagoa Bay, p. 113; RAGONOT, Ann. Soc. Ent. Fr. 1891.

†*Epizonora*, n. g., near *Zonora*, for *Hypotia speciosalis*, Chr.; RAGONOT, p. 637, Ann. Soc. Ent. Fr. 1891.

*Eschata ochreipes*, S. India, HAMPSON, p. 143, pl. clvi, fig. 23, Ill. Lep. Het. viii, n. sp.

†*Essina*, n. g., p. 28, for *E. atribasalis*, n. sp., Lagoa Bay, p. 29; RAGONOT, Ann. Soc. Ent. Fr. 1891.

*Endotricha albicilia*, S. India, HAMPSON, p. 130, pl. cliv, fig. 22, Ill. Lep. Het. viii; *E. (P) stenialis*, Borneo, p. 68, *E. flavifimbrialis*, E. India and Formosa, *rufofimbrialis*, p. 69, *flavifusalis*, p. 70, Borneo, WARREN, Ann. N. H. (6) viii: n. spp.

*Eumelia venustalis*, Cram., = (*testula*, Hb., = *Botys divulsalis*, Zell., = *Scopula jucundalis*, Wlk.); WARREN, Ent. xxiv, p. 181.

†*Eupoca*, n. g., for *E. acutalis*, p. 63, *cinerea*, p. 64, n. spp., Callao; WARREN, Ann. N. H. (6) viii.

†*Eutrichodes*, n. g.; type, *Pyralis ravalalis*, Wlk.; WARREN, p. 498, Ann. N. H. (6) vii.

*Euzophera semifuneralis*, habits and metamorphosis; FORBES, Rep. xvii, p. 26-29, pl. ii. *E. pinguis*, metamorphoses described and figured; SEPP, Nederl. Ins. (2) iv, pp. 171-179, pl. xxxii.

*Flavinia gopala*, Venezuela, DOGNIN, Le Nat. 1891, p. 109, n. sp.

*Galaza*, Wlk., = (*Cordylopeza*, Z.); RAGONOT, p. 618, Ann. Soc. Ent. Fr. 1891.

*Galasa major*, Columbia, WARREN p. 500, Ann. N. H. (6) vii, n. sp.

*Glyphodes opalalis*, S. India, HAMPSON, p. 135, pl. clv, fig. 20, Ill. Lep. Het. viii, n. sp.

*Godara suffusalis*, S. India, HAMPSON, p. 135, pl. clv, figs. 4 & 12, Ill. Lep. Het. viii, n. sp.

↓ *Gonodiscus*, n. g. (*Pyrilidinae*) for *G. amplalis*, n. sp., Coquimbo; WARREN, p. 430, Ann. N. H. (6) vii.

↓ *Goossensia*, n. g., p. 97, for *G. prasinalis*, n. sp., Malacca, p. 98; RAGONOT, Ann. Soc. Ent. Fr. 1891.

*Haritala delicatalis*, S. India, HAMPSON, p. 137, pl. clv, fig. 5, Ill. Lep. Het. viii, n. sp.

*Herbula torvalis*, Moesch., = (*Scoparia gelida*, MacLach.); WARREN, Ent. xxiv, p. 180.

*Herculia*, Wlk., = (*Dolichomia*, Rag.); RAGONOT, p. 628, Ann. Soc. Ent. Fr. 1891.

*H. aurociliatis*, pl. cliv, fig. 19, *ochreicilia*, fig. 3, S. India, HAMPSON, p. 130, Ill. Lep. Het. viii, n. spp.

↓ *Holoperas*, n. g., near *Galasa*, for *H. innotata*, n. sp., Columbia; WARREN, p. 500, Ann. N. H. (6) vii.

*Homura trisulcata*, Rio Janeiro, WARREN, p. 434, Ann. N. H. (6) vii, n. sp.

↓ *Hyboloma*, n. g., for *H. nummosalis*, n. sp., Borneo; RAGONOT, p. 99, Ann. Soc. Ent. Fr. 1891.

↓ *Hypanchyla*, n. g. : type, *Pyralis mariculis*, Wlk.; WARREN, Ann. N. H. (6) vii, p. 498.

↓ *Hyperbalanotis*, n. g.; type, *Glossina achatina*, Butl., and including *H. olivacea*, n. sp., Japan; WARREN, p. 433, Ann. N. H. (6) vii.

↓ *Hyperparachma*, n. g.; type, *Pyralis bursarialis*, Wlk., and including *H. rubrifusca*, n. sp., S. Paolo; WARREN, p. 61, Ann. N. H. (6) viii.

*Hypsopygia*, Hb. : note on its application; WARREN, p. 495, Ann. N. H. (6) vii.

*H. laticiliatis*, Madagascar, RAGONOT, p. 28; *H. sericea*, Darjiling, japonica, Japan, WARREN, p. 499, Ann. N. H. (6) vii : n. spp.

↓ *Idioblasta*, n. g., for *I. lacteata*, *straminata*, n. spp., Marquesas Is.; WARREN, p. 62, Ann. N. H. (6) viii.

↓ *Idneodes*, n. g. (*Chrysauginæ*) p. 604, for *I. tretopteralis*, n. sp., Brazil, p. 605; RAGONOT, Ann. Soc. Ent. Fr. 1891.

*Isocentris filalis*, Gn., list of synonyms of; *I.*, sub *Botys*, *xanthialis*, Gn., = (*superbalis*, Wlk., = *nicalis*, Snell.); WARREN, Ent. xxiv, p. 184.

*I. undulilinea*, S. India, HAMPSON, p. 132, pl. cliv, fig. 21, Ill. Lep. Het. viii, n. sp.

↓ *Itambe*, n. g. (*Chrysauginæ*), p. 607, for *I. fenestalis*, n. sp., Brazil, p. 608; RAGONOT, Ann. Soc. Ent. Fr. 1891.

↓ *Koptoplax*, n. g., near *Otopla*, Wlk., p. 126, for *K. lindsayi*, n. sp., S. India, p. 127, pl. cliv, fig. 17, HAMPSON, Ill. Lep. Het. viii.

↓ *Koremalepis*, n. g., near *Stemmatophora*, for *K. scopula*, n. sp., S. India, pl. cliv, figs. 2 & 15; HAMPSON, p. 129, Ill. Lep. Het. viii.



*Larice*, n. g., near *Philotis*, p. 640, for *L. swinhoei*, n. sp., E. India, p. 641 ; RAGONOT, Ann. Soc. Ent. Fr. 1891.

*Leptoctenista*, n. g., p. 436, for *L. dubia*, n. sp., Rio Janeiro, p. 437, WARREN, Ann. N. H. (6) vii.

*Leucocraspeda udcoides*, S. India, HAMPSON, p. 134, pl. clv, fig. 17, Ill. Lep. Het. viii, n. sp.

*Libora*, n. g., for *gadesalis*, Rag. ; RAGONOT, p. 89, Ann. Soc. Ent. Fr. 1891.

*Lissophanes*, n. g., for *L. ceramica*, n. sp., Callao ; WARREN, p. 67, Ann. N. H. (6) viii.

*Lomotropa vellerialis*, Oby I., SNELLEN, p. 239, Notes Leyd. Mus. xiii, n. sp.

*Megalomia*, n. g., for *Pyrallis angulifuscia*, Moore, RAGONOT, p. 35, Ann. Soc. Ent. Fr. 1891.

*Melissoblaptēs anellus*, scent of ♂ ; HINNEBERG, p. 71, S. E. Z. 1891.

*Micraglossa*, n. g., p. 65, for *M. scoparialis*, n. sp., Darjiling, p. 66 ; WARREN, Ann. N. H. (6) viii.

*Micreremites*, n. g., near *Sufetula*, Wlk., for *M. fatua*, Calcutta ?, p. 66, and *vasalis*, Dharmasala, p. 67, n. spp. ; WARREN, Ann. N. H. (6) viii.

*Microsca striativena*, S. India, HAMPSON, p. 126, pl. cliv, fig. 1, Ill. Lep. Het. viii, n. sp.

*Mimaglossa*, n. g. ; type, *Glossina habitalis*, Gn., p. 427, and including *M. revulsa*, n. sp., Australia, p. 428 ; WARREN, Ann. N. H. (6) vii.

*Myelois viridis*, Madagascar, SAALMÜLLER, p. 510, Lep. Madag., n. sp.

*Nachaba carbonalis*, p. 423, *flavisparsalis*, *cinerascens*, p. 424, Espiritu Santo, WARREN, Ann. N. H. (6) vii, n. spp.

*Nephopteryx sagittiferella*, Perak, p. 21, *punicælla*, Beluchistan, p. 28, MOORE, Ind. Mus. Notes, ii, n. spp.

*Notarcha dubia*, E. India, HAMPSON, p. 136, pl. clv, fig. 16, Ill. Lep. Het. viii, n. sp.

*Oectoperodes*, n. g. (*Chrysauginæ*), p. 612, for *O. rufitinctalis*, n. sp., Brazil ; RAGONOT, p. 613, Ann. Soc. Ent. Fr. 1891.

*Oedematodes*, n. g., for *Stemmatophora chilensis*, Z. ; RAGONOT, p. 623, Ann. Soc. Ent. Fr. 1891.

*Oligostigma angulipennis*, S. India, HAMPSON, p. 139, pl. clv, fig. 6, Ill. Lep. Het. viii, n. sp.

*Opsibotys coclesalis*, Wlk., = (*itemalisalis*, *strenualis*, and *interfusalis*, Wlk.) ; *terrealis*, Tr., = (*mysippusalis*, Wlk., and *humilalis*, Led.) ; *extricalis*, Gn., = (*Pionea dionalis*, Wlk., = *Spilodes nisæcalis*, Wlk., = *Bot. intricatalis*, Led., and *oppilalis*, Gr.) ; WARREN, Ent. xxiv, pp. 183 & 184.

*O. crocalis*, pl. cliv, fig. 7, p. 131, *nubilalis*, fig. 12, *tinctalis*, fig. 6, *coorumba*, fig. 13, p. 132, S. India, HAMPSON, Ill. Lep. Het. viii, n. spp.

*Oromena commutanda*, n. n. for *O. reliquenda*, Moore, nec Wlk. ; WARREN, p. 426, Ann. N. H. (6) vii.

*Orthopygia*, n. g., p. 29, for part of *Pyrallis* and *Asopia*, including also

*O. pernigralis*, n. sp., China ?, p. 32 ; RAGONOT, Ann. Soc. Ent. Fr. 1891.  
Cf. also *Dolichomia*.

*Orthospila angulifascia*, S. India, HAMPSON, p. 136, pl. clv, fig. 10, Ill. Lep. Het. viii, n. sp.

† *Orthotrichophora*, n. g. ; type, *Bertula syrichtusalis*, Wlk. ; WARREN, p. 429, Ann. N. H. (6) vii.

† *Oryctocera*, n. g., p. 51 ; type, *O. aurocupralis*, n. sp., Cape Good Hope, p. 52 ; RAGONOT, Ann. Soc. Ent. Fr. 1891.

*Pachyinoa fuscilalis*, S. India, HAMPSON, p. 133, pl. clv, fig. 2, Ill. Lep. Het. viii, n. sp.

† *Palmitia*, n. g., for *massilialis*, Dup. ; RAGONOT, p. 70, Ann. Soc. Ent. Fr. 1891.

† *Palura*, n. g. ; type, *Hypotia vulgaris*, Butl. ; RAGONOT, p. 61, Ann. Soc. Ent. Fr. 1891.

*Parachma*, Wlk., = (*Zazaca*, Wlk., and *Perseis*, Rag.) ; RAGONOT, p. 624, Ann. Soc. Ent. Fr. 1891.

√ *Paractenia*, n. g., near *Stemmatophora*, for *Pyrallis rubicundalis*, Swinh. ; RAGONOT, p. 642, Ann. Soc. Ent. Fr. 1891.

*Paracymoriza albifascialis*, pl. clvi, figs. 1 & 9, *olivalis*, pl. clv, fig. 8, p. 140, *dentifascialis*, fig. 21, p. 141, S. India, HAMPSON, Ill. Lep. Het. viii, n. spp.

*Parasarama* (?) *nigrescens*, Yesso, WARREN, p. 428, Ann. N. H. (6) vii, n. sp.

*Paredra catochrysalis*, Madagascar, RAGONOT, p. 78, Ann. Soc. Ent. Fr. 1891, n. sp.

√ *Paridnea*, n. g. (*Chrysauginæ*), p. 602, for *P. holophæalis*, n. sp., Brazil, p. 603 ; RAGONOT, Ann. Soc. Ent. Fr. 1891.

√ *Peucela*, n. g., for some species of *Pyrallis*, &c. ; RAGONOT, p. 47, Ann. Soc. Ent. Fr. 1891.

√ *Philotis*, n. g., p. 81, for *P. radamalis*, Madagascar, *punctilimbalis*, Natal, n. spp., p. 82 ; RAGONOT, Ann. Soc. Ent. Fr. 1891.

*Phlyctenia luteomarginalis*, S. India, HAMPSON, p. 134, pl. clv, fig. 18, Ill. Lep. Het. viii, n. sp.

√ *Pleonectoides*, n. g., near *Pleonectusa*, for *P. vinacea*, n. sp., S. India, pl. clv, fig. 19 ; HAMPSON, p. 134, Ill. Lep. Het. viii.

√ *Precopia*, n. g., for *atomalis*, Chr. ; RAGONOT, p. 67, Ann. Soc. Ent. Fr. 1891.

√ *Proboscidophora*, n. g. ; type, *Pyrallis tritonalis*, Wlk. ; WARREN, p. 429, Ann. N. H. (6) vii.

*Propeus magnificus*, Colorado, FERNALD, p. 30, Canad. Ent. xxiii, n. sp.

*Protonoceras fuscilunalis*, S. India, HAMPSON, p. 134, pl. clv, fig. 22, Ill. Lep. Het. viii, n. sp.

√ *Pseudolocastra*, n. g. ; type, *Locastra inimica*, Butl. ; WARREN, p. 429, Ann. N. H. (6) vii.

*Pyrallis latifascia*, p. 129, pl. cliv, fig. 8, *albolinealis*, p. 130, fig. 10, S. India, HAMPSON, Ill. Lep. Het. viii ; *P. albiguttata*, Japan, *albilautalis*, p. 496, *oleagina*, Natal, *tabidalis*, Callao, *monostechalis*, Dharmasala, p. 497, WARREN, Ann. N. H. (6) vii : n. spp.

*Ræseliodes*, n. g., *Epipaschiinæ*, for *R. ochreosticta*, *dissimilis*, n. spp., Rio Janeiro; WARREN, p. 435, Ann. N. H. (6) vii.

*Schenobius maximellus*, Texas, FERNALD, p. 30, Canad. Ent. xxiii, n. sp.

*Scoparia rufostigma*, pl. cliv, fig. 4, *olivaris*, fig. 11, S. India, HAMPSON, p. 131, Ill. Lep. Het. viii, n. spp.

*Sedenia biundulalis*, Zell., is a *Noctuid*; SMITH, p. 120, Tr. Am. Ent. Soc. xviii.

*Spectrotrota*, n. g. (*Pyralidinæ*), p. 426, for *S. fimbrialis*, n. sp., Australia, p. 427; WARREN, Ann. N. H. (6) vii.

*Spilodes helvialis*, Wlk., = (*Botys thycesalis* and *apertalis*, Wlk., and *B. citrina*, Gr. & R.; *obliteralis*, Wlk., = *marculenta*, Gr. & R.), *mancalis*, Led., (= *marculenta*, Zell.); WARREN, Ent. xxiv, p. 182. *S. verticalis*, metamorphoses; CHRÉTIEN, Le Nat. 1891, p. 249. *S. æruginalis*, metamorphoses; *id. t. c.* p. 186.

*Stemmatophora vulpeculalis*, Algeria, p. 87, *tacapealis*, Tunis, *cæsarealis*, Asia Minor, p. 88, RAGONOT, Ann. Soc. Ent. Fr. 1891; *S. duplicata*, Hindostan, *albilineata*, Natal, WARREN, p. 437, Ann. N. H. (6) vii; *S. salmo*, pl. cliv, fig. 18, *S. ? longipennis*, fig. 20, S. India, HAMPSON, p. 128, Ill. Lep. Het. viii : n. spp.

*Stericta cinerascens*, Parramatta, *papuensis*, New Guinea, p. 431, *marmorea*, Tasmania, p. 432, WARREN, Ann. N. H. (6) vii, n. spp.

*Sybrida*, *Paravetta* and *Danaka* are one genus, which is referred to *Pyralidæ*; RAGONOT, p. 72, Ann. Soc. Ent. Fr. 1891.

*S. inflammealis*, *constrictalis*, Upper Assam, RAGONOT, p. 75, Ann. Soc. Ent. Fr. 1891, n. spp.

*Synaphe pertusalis*, n. var. *vitrea*; WARREN, p. 436, Ann. N. H. (6) vii.

*Tegulifera sanguinea*, Madagascar, WARREN, p. 68, Ann. N. H. (6) viii, n. sp.

*Therapne*, n. g., for *obsoletalis*, Mn.; RAGONOT, p. 83, Ann. Soc. Ent. Fr. 1891.

*Threnodes pollinalis*, var. noticed; REBEL, p. 612, Verh. z.-b. Wien, xli.

*Thysanoidma*, n. g., near *Homophyca*, for *T. octalis*, n. sp., S. India, pl. clvi, fig. 19; HAMPSON, p. 142, Ill. Lep. Het. viii.

*Titanio echinæa*, n. n. for *T. (Noctuomorpha) venustalis*, Led., nec Cram.; MEYRICK, Ent. M. M. (2) ii, p. 50.

*T. zachlora*, Biskra, MEYRICK, Ent. M. M. (2) ii, p. 11, n. sp.

*Trebania*, n. g., for *Propachys flavifrontalis*, Leech; RAGONOT, p. 646, Ann. Soc. Ent. Fr. 1891.

*Tretopteryx*, n. g., for *pertusalis*, Hb.; RAGONOT, p. 95, Ann. Soc. Ent. Fr. 1891.

*Trichophysetis duplifascialis*, S. India, HAMPSON, p. 141, pl. clvi, fig. 18, Ill. Lep. Het. viii, n. sp.

*Tyndis*, n. g., p. 83; type, *T. tanganyialis*, n. sp., E. Africa, p. 85, and including *Hypotia allalis* and *Cledeobia hypotialis*, Swinh.; RAGONOT, Ann. Soc. Ent. Fr. 1891.

*Tyspanodes*, n. g. (*Pyralidinæ*), for *T. flaviventer*, Darjiling, p. 425, *hypsalis*, N. China, p. 426, n. spp.; WARREN, Ann. N. H. (6) vii.

*Ugra*, Wlk., = (*Euexippe*, Rag.); RAGONOT, p. 624, Ann. Soc. Ent. Fr. 1891.

*U. angustipennis*, Colorado, WARREN, p. 494, Ann. N. H. (ð) vii, n. sp.

*Uliosoma*, n. g.; type, *Isopteryx discoloralis*, Wlk.; WARREN, p. 500, Ann. N. H. (ð) vii.

*Ulotrichodes*, n. g., for *U. monotaxialis*, n. sp., W. Africa; RAGONOT, p. 58, Ann. Soc. Ent. Fr. 1891.

*Xestula*, Snell., merged in *Sybrida*, Wlk.; RAGONOT, p. 73, Ann. Soc. Ent. Fr. 1891.

*Zania*, Wlk., = (*Endotrichodes*, Rag.); RAGONOT, p. 620, Ann. Soc. Ent. Fr. 1891.

*Zitha*, Wlk., = (*Angenora*); RAGONOT, p. 639, Ann. Soc. Ent. Fr. 1891.

### TORTRICIDÆ.

[*Cf.* BERG (52), BUCHENAU (108), CARPENTER (133), DURRANT (220), ELISHA (238), HAMPSON (369), HERING (388), HOFMANN (395), JOANNIS (443), MEYRICK (583, 585), MURTFELDT (607), REBEL (685), STANGE (838), WALSINGHAM (917, 918, 922, 923).]

List of *Microlepidoptera* found at Cannes, including food-plants and dates of breeding and capture; WALSINGHAM, Ent. M. M. (2) ii, pp. 141-152.

For notes on many Pomeranian species, see HERING, S. E. Z. 1891, pp. 143-159.

*Adoxophyes camelina*, New Zealand, MEYRICK, p. 97, Tr. N. Z. Inst. xxiii, n. sp.

*Antithesia montana*, Araucania, BARTLETT-CALVERT, Ent. M. M. (2) ii, p. 316, n. sp. (but *cf.* Zool. Rec. xxvii, *Ins.* p. 267).

*Argyrolepis maritimana*, early stages of; ELISHA, Ent. xxiv, pp. 277 & 278, pl. v.

*Argyrotoxa tigrina*, Natal, p. 66, pl. iii, fig. 2, *flavicostana*, Gambia, p. 67, fig. 3, *viridis*, Accra, p. 68, fig. 4, WALSINGHAM, Tr. E. Soc. 1891, n. spp.

*Cucocharis*, n. g., near *Pædisca*, for *C. albimacula*, n. sp., St. Vincent, details figured, pl. xli, fig. 4; WALSINGHAM, p. 503, P. Z. S. 1891.

*Cacœcia adustana*, Wlsm., systematic position queried; WALSINGHAM, p. 64, Tr. E. Soc. 1891.

*C. occidentalis*, Gambia, WALSINGHAM, p. 64, pl. iii, fig. 1, Tr. E. Soc. 1891, n. sp.

*Carpocapsa saltitans*, notes on; BERG, An. Soc. Arg. xxxi, pp. 97, &c.: the plant in which it lives; RILEY, Le Nat. 1891, p. 268; also BUCHENAU (108) and HOFMANN, S. E. Z. 1891, pp. 254-286.

*Catoptria decolorana*: error as to habits of larva noticed; BARRETT, Ent. M. M. (2) ii, pp. 101-103.

*Cerorrhineta*, Z., recharacterised, the name altered to *Ceratorrhineta*, p. 499, details of structure of type figured, pl. xli, figs. 2 a-e; WALSINGHAM, P. Z. S. 1891.

*Conchylis affinitana*, Dgl., = (*cancellana*, Z.), *heydeniana*, H.-S., and

*implicitana*, Wk., synonymy discussed; WALSINGHAM, Ent. M. M. (2) ii, pp. 1-3.

*C. (Eupæcilia) erigerana* (= *anthemidana*, McL. ex parte), Britain, WALSINGHAM, p. 3, Ent. M. M. (2) ii; *C. armeniana*, Asia Minor, JOANNIS, p. lxxxiii, Bull. Soc. Ent. Fr. 1891; *C. chionopa*, Biskra, MEYRICK, Ent. M. M. (2) ii, p. 55; *C. tricolor*, Gambia, WALSINGHAM, p. 69, pl. iii, fig. 5, Tr. E. Soc. 1891. [Described as n. sp., but, t. c. p. 131, considered to be *Tortrix (Dichelia) albardana*, Snell.] *C. lacteipalpis*, St. Vincent, W. I., WALSINGHAM, p. 500, P. Z. S. 1891, n. spp.

*Coptoloma dimidiata*, Gambia, WALSINGHAM, p. 76, pl. iii, fig. 14, Tr. E. Soc. 1891; *C. ? albicapitana*, St. Vincent, id. p. 505, P. Z. S. 1891, n. sp.

*Cryptophasa unipunctata*, Don., habits and metamorphoses; EDWARDS, Ins. Life, iii, p. 384, fig. 30.

*Dichrorampha eacisa*, Gambia, WALSINGHAM, p. 76, pl. iii, fig. 15, Tr. E. Soc. 1891, n. sp.

*Eccopsis ? nebulana*, Gambia, WALSINGHAM, p. 71, pl. iii, fig. 7, Tr. E. Soc. 1891, n. sp.

*Episimus*, n. g., *Grapholithinæ*; type, *Carpocapsa transferrana*, Wkr., details of which are figured, pl. xli, figs. 3a & b, and n. var. *vincentana* described, p. 502; WALSINGHAM, P. Z. S. 1891, p. 501.

*Eudemis isochroa*, Algeria, MEYRICK, Ent. M. M. (2) ii, p. 12, n. sp.

*Eupæcilia sodaliana*, larva described; SHIELDON, Ent. M. M. (2) ii, p. 301. *E. geyeriana*, larva described; RICHARDSON, t. c. p. 239. *E. pallidana*, larva described; BANKES, t. c. p. 273.

*Grapholitha spissana*, Z., referred to *Eudemis* and figured; WALSINGHAM, p. 70, pl. iii, fig. 6, Tr. E. Soc. 1891. *G. tetraquetrana*, Hw., *immundana*, *scopariana*, habits of larvæ; STANGE, S. E. Z. 1891, pp. 132 & 133.

*G. (Pædisca) dalmatana*, Dalmatia, REBEL, p. 620, Verh. z.-b. Wien, xli; *G. livens*, St. Vincent, WALSINGHAM, p. 504, P. Z. S. 1891; *G. motrix*, Uruguay, BERG, p. 108, An. Soc. Arg. xxxi : n. spp.

*Heligmocera*, n. g., p. 507, with details, pl. xli, figs. 5a-d, for *H. calvifrons*, n. sp., St. Vincent, p. 508; WALSINGHAM, P. Z. S. 1891.

*Heterocrossa charaxias*, New Zealand, MEYRICK, p. 98, Tr. N. Z. Inst. xxiii, n. sp.

*Loxotania dorsiplagana*, Wlsm., referred to *Pandemis*; WALSINGHAM, p. 66, Tr. E. Soc. 1891.

*Palæobia longestriata*, Australia, DURRANT, P. Linn. Soc. N.S.W. (2) vi, p. 17, n. sp.

*Penthina chionosema*, larva described; MURTFELDT, Bull. Dep. Agric. Ent. No. 23, p. 51.

*P. brevibasana*, Natal, WALSINGHAM, p. 71, pl. iii, fig. 8, Tr. E. Soc. 1891, n. sp.

*Phæcasiophora variabilis*, p. 73, pl. iii, fig. 10, *basicornis*, p. 74, fig. 11, Gambia, WALSINGHAM, Tr. E. Soc. 1891, n. spp.

*Phoxopteris oculifera*, pl. iii, fig. 12, *falcata*, fig. 13, Gambia, WALSINGHAM, p. 75, Tr. E. Soc. 1891, n. spp.

*Proteopteryx spoliata*, larva described ; MURTFELDT, Bull. Dep. Agric. Ent. No. 23, p. 51.

↓ *Ptychamorbia*, n. g., p. 497, details of structure, pl. xli, figs. 1a-f; type, *Tortrix ezustana*, Z., with *P. catenana*, n. sp., St. Vincent and Brazil, p. 498 ; WALSINGHAM, P. Z. S. 1891.

*Sciaphila semibrunneata*, Algeria, JOANNIS, p. lxxxii, Bull. Soc. Ent. Fr. 1891, n. sp.

*Semasia bucephaloides*, California, WALSINGHAM, p. 465, *Ins. Life*, iii, n. sp.

*Sericoris apicipunctana*, Gambia, WALSINGHAM, p. 72, pl. iii, fig. 9, Tr. E. Soc. 1891, n. sp.

*Simæthis flavimaculata*, Zanzibar, WALSINGHAM, p. 77, pl. iii, fig. 16, Tr. E. Soc. 1891, n. sp.

*Steganoptycha rubiginosana*, larva described ; HERING, p. 155, S. E. Z. 1891.

*S. pyricolana* (Riley MS.), N. America, MURTFELDT, p. 52, Bull. Dep. Agric. Ent. No. 23, n. sp.

*Strepsicrates smithiana*, St. Vincent, Dominica, WALSINGHAM, p. 506, P. Z. S. 1891, n. sp.

*Teras reciprocana*, Wlk., referred to *Pandemis* ; WALSINGHAM, p. 66, Tr. E. Soc. 1891. *T. variegana*, metamorphoses described and figured ; SEPP, Nederl. Ins. (2) iv, pp. 219-226, pl. xxxix.

*T. verditer*, p. 143, pl. clvi, fig. 25, *subtusnigra*, fig. 21, p. 144, S. India, HAMPSON, Ill. Lep. Het. viii, n. spp.

*Tortrix capitana*, F. & R., referred to *Pandemis* ; WALSINGHAM, p. 66, Tr. E. Soc. 1891. *T. unifasciana*, *neglectana*, distinctions ; REBEL, p. 617, Verh. z.-b. Wion, xli. *T. staudingerana*, Maassen, referred to *Cryptolechia* ; SNELLEN, p. 191, Tijdschr. Ent. xxxiv. *T. (Ptycholoma) lecheana*, metamorphoses described and figured ; SEPP, Nederl. Ins. ii, pp. 227-231, pl. xl. *T. donelana*, notes on ; SOUTH, Ent. xxiv, p. 253.

*T. donelana*, Ireland, CARPENTER, P. R. Dubl. Soc. (n.s.) vii, p. 92, pl. vii ; *T. xylotoma*, Algeria, MEYRICK, Ent. M. M. (2) ii, p. 13 ; *T. cesareana*, Asia Minor, JOANNIS, p. lxxxiii, Bull. Soc. Ent. Fr. 1891 : n. spp.

#### TINEIDÆ.

[Cf. BARRETT (29), BUGNION (113), FERNALD (279), GRIFFITH (350), HERING (386, 388), JOANNIS (443), MEYRICK (583, 585), REBEL (685), STANGE (838), WALSINGHAM (917, 918, 920, 921, 924), WOOD (966, 967).]

Structure of the ovipositor in various forms discussed ; WOOD, Ent. M. M. (2) ii, pp. 175 & 212.

For notes on many Pomeranian species, see HERING, S. E. Z. 1891, pp. 159-222.

*Acrolophus vitellus*, Poey, characters of, p. 512, pl. xli, fig. 11, *walsinghami*, ♂ characters, p. 514, fig. 13 ; WALSINGHAM, P. Z. S. 1891.

*A. poeyi*, p. 512, pl. xli, fig. 12, St. Vincent, *niveipunctata*, Cuba, p. 513, WALSINGHAM, P. Z. S. 1891, n. sp.

*Acureuia lentiginosa*, Z., referred to *Tiquadra* ; WALSINGHAM, p. 518, P. Z. S. 1891.

*Adela rufimitrella*, life-history ; CHAPMAN, Ent. M. M. (2) ii, p. 191.

*A. cuneella*, Natal, WALSINGHAM, p. 88, pl. iv, fig. 26, Tr. E. Soc. 1891, n. sp.

*Agriocoma mimulina* n. var. *araucana* ; BARTLETT-CALVERT, Ent. M. M. (2) ii, p. 316 (but see Zool. Rec. xxvii), n. sp.

*Amydria anaphorella*, St. Vincent, WALSINGHAM, p. 517, P. Z. S. 1891, n. sp.

*Anacampsis fulvistilella*, Dalmatia, REBEL, p. 632, Verh. z.-b. Wien, xli, n. sp.

*Anaphora leucodocis*, Z., referred to *Acrolophus*, and *A. pusilla* to *Cœnogenes* ; WALSINGHAM, p. 514, P. Z. S. 1891.

*A. noctuina*, Cuba, WALSINGHAM, p. 515, P. Z. S. 1891, n. sp.

*Anarsia agricola*, Natal and Gambia, p. 111, pl. v, fig. 48, *inculta*, Gambia, p. 112, fig. 49, WALSINGHAM, Tr. E. Soc. 1891, n. spp.

*Anorthosia fracticostella*, Accra, WALSINGHAM, p. 110, pl. v, fig. 45, neurulation and head, pl. vii, fig. 84, Tr. E. Soc. 1891, n. sp.

*Anybia conspersa*, p. 537, *curvipunctella*, p. 538, St. Vincent, WALSINGHAM, P. Z. S. 1891, n. spp.

*Apiletria acutipennis*, Gambia, p. 106, pl. v, fig. 42, neurulation and head, pl. vii, fig. 82, WALSINGHAM, Tr. E. Soc. 1891, n. sp.

*Aplota palpella*, habits and larva described ; WOOD, Ent. M. M. (2) ii, pp. 271 & 272.

*Apodia doliodes*, p. 55, *psamathias*, p. 56, Algeria, MEYRICK, Ent. M. M. (2) ii, p. 56, n. spp.

*Atychia albiciliata*, Natal, WALSINGHAM, p. 78, pl. iii, fig. 17, Tr. E. Soc. 1891, n. sp.

↓ *Autochthonus*, n. g., *Euplocaminæ*, p. 82, with fig. of neurulation and palpi, pl. vii, fig. 74, for *A. chalybiellus*, n. sp., Gambia, p. 83, pl. iv, fig. 22 ; WALSINGHAM, Tr. E. Soc. 1891.

↓ *Auximobasis*, n. g., *Butalinæ*, for *A. persimilella*, n. sp., St. Vincent, details of structure, pl. xli, figs. 9a-c ; WALSINGHAM, p. 534, P. Z. S. 1891.

↑ *Barbaroscardia*, n. g., *Euplocaminæ*, neurulation and head figured, pl. vii, fig. 76, for *B. fasciata*, n. sp., Delagoa Bay, pl. iv, fig. 23 ; WALSINGHAM, p. 84, Tr. E. Soc. 1891.

*Blastobasis irroratella*, Gambia, WALSINGHAM, p. 122, pl. vi, fig. 63, Tr. E. Soc. 1891, n. sp.

*Brachycrossata*: characters given, p. 98, *Gelechia (Nothris) septella*, Z., referred to it, p. 99 ; WALSINGHAM, Tr. E. Soc. 1891.

*B. marginata*, Gambia, WALSINGHAM, p. 99, pl. iv, fig. 35, Tr. E. Soc. 1891 ; *B. psoricopterella*, St. Vincent, WALSINGHAM, P. Z. S. 1891 : n. spp.

*Bryotropha translucida*, Lesser Antilles, WALSINGHAM, p. 520, P. Z. S. 1891, n. sp.

*Butalis subburnea*, Gambia, WALSINGHAM, p. 122, pl. vi, fig. 62, Tr. E. Soc. 1891, n. sp.

*Cacochroa*, Hein., = (*Teratopsis*, Wlsm.); WALSINGHAM, p. 114, Tr. E. Soc. 1891.

↓ *Calycobathra*, n. g., p. 59, near *Statmopoda*, for *C. acarpa*, n. sp., Biskra, p. 60; MEYRICK, Ent. M. M. (2) ii.

↓ *Calyptrotis*, n. g., near *Monochroa*, for *C. alphetodes*, n. sp., Biskra; MEYRICK, p. 56, Ent. M. M. (2) ii.

*Ceromitia*, Z., = (*Agisana*, Mschl.), neuration described; *Nemophora turpisella*, Wlk., = (*Agisana cafrariella*, Msch.), and *M. alternipunctella*, Wlsm., referred to it; WALSINGHAM, pp. 87 & 88, Tr. E. Soc. 1891.

*Choregia*, Z., sunk as *Tortyra*, Wkr.; WALSINGHAM, p. 528, P. Z. S. 1891.

*Coleophora bifrondella*, p. 137, *stæhelinella*, p. 138, Cannes, WALSINGHAM, Ent. M. M. (2) ii; *C. parthenica*, Biskra, MEYRICK, t. c. p. 59: n. spp.

*Compsocena primella*, Z., ♀ described; WALSINGHAM, p. 85, Tr. E. Soc. 1891.

*Coptotriche zelleriella*, note on; WALSINGHAM, *Ins. Life*, iii, p. 386.

*Coriscium sulphurellum*, habits of larva discussed; HERING, pp. 99–101, S. E. Z. 1891.

*Cosmopteryx cognita*, Natal, WALSINGHAM, p. 124, pl. vi, fig. 64, Tr. E. Soc. 1891; *C. sanctivincentii*, West Indies, WALSINGHAM, p. 536, P. Z. S. 1891: n. spp.

*Cryptotechia*, Z.: characters and composition discussed, and neuration figured; WALSINGHAM, pp. 100–102, pl. vii, fig. 86, Tr. E. Soc. 1891 (*cf. Odites* and *Idiopteryx*, *infra*). *C.*: *Tortrix staudingerana*, Maas, referred to the genus; SNELLEN, p. 191, Tijdschr. Ent. xxxiv. *C. straminella*, Z., neuration and head figured; WALSINGHAM, pl. vii, fig. 86, Tr. E. Soc. 1891.

*Decadarchis* (redefined, p. 99), with *monarcha*, New Zealand, p. 100, MEYRICK, Tr. N. Z. Inst. xxiii, n. sp.

↓ *Dendroneura*, n. g.; type of the n. subfam. *Dendroneurinae*, p. 503, with details, pl. xli, figs. 6 a–c, for *D. præstans*, n. sp., St. Vincent, p. 510; WALSINGHAM, P. Z. S. 1891.

*Depressaria irrorata*, Stgr., supplement to description; REBEL, p. 627, Verh. z.-b. Wien, xli.

*D. crassiventrella*, Dalmatia, REBEL, p. 627, Verh. z.-b. Wien, xli; *D. inornatella*, Gambia, WALSINGHAM, p. 113, pl. v, fig. 51, Tr. E. Soc. 1891: n. spp.

*Diastoma squamosa*, St. Vincent, WALSINGHAM, p. 524, P. Z. S. 1891, n. sp.

↓ *Didactylota*, n. n. for *Dactylota*, Snell., with *D. bicolor*, n. sp., St. Vincent, WALSINGHAM, p. 522, P. Z. S. 1891.

*Dissoctena affinis*, Natal, WALSINGHAM, p. 81, pl. iv, fig. 21, Tr. E. Soc. 1891, n. sp.



*Dolichernis*, n. g., *Plutellidæ*, for *D. chloroleuca*, n. sp., New Zealand ; MEYRICK, p. 99, Tr. N. Z. Inst. xxiii.

*Elachista baltica*, Her., characters and larva noticed ; HERING, pp. 207 & 208, S. E. Z. 1891.

*E. echidnias*, Biskra, MEYRICK, Ent. M. M. (2) ii, p. 61, n. sp.

*Ergatis amanella*, Asia Minor, JOANNIS, p. lxxxiii, Bull. Soc. Ent. Fr. 1891, n. sp.

*Eriocottis pyrocoma*, Algeria, MEYRICK, Ent. M. M. (2) ii, p. 58, n. sp.

*Eulepiste*: emendation of description ; WALSINGHAM, p. 511, P. Z. S. 1891.

*E. umbratipalpis*, San Domingo, WALSINGHAM, p. 511, pl. xli, fig. 10, P. Z. S. 1891, n. sp.

*Felderia dimidiella*, Cuba, WALSINGHAM, p. 516, P. Z. S. 1891, n. sp.

*Gelechia ocellatella*, broods of, and retarded emergence ; BANKES, Ent. M. M. (2) ii, p. 48. *G. intermediella*, Chamb.?, larva described ; MURTFELDT, p. 53, Bull. Dep. Agric. Ent. No. 23. *G. lamprostoma*, Z. = (*zulu*, Wlsm.) ; WALSINGHAM, p. 94, Tr. E. Soc. 1891.

*G. (Anacampsis) sparsiciliella*, Britain, BARRETT, Ent. M. M. (2) ii, p. 7 ; *G. eremaula*, Biskra, MEYRICK, Ent. M. M. (2) ii, p. 57 ; *G. hutchinsonella*, Natal, p. 93, pl. iv, fig. 30, *palpigera*, Delagoa Bay, p. 94, fig. 31, WALSINGHAM, Tr. E. Soc. 1891 ; *G. cinereocervina*, St. Vincent, WALSINGHAM, p. 519, P. Z. S. 1891 : n. spp.

*Glyphidocera*, n. g., *Xyloryctinæ*, for *G. audax*, n. sp., St. Vincent, with fig. of details, pl. xli, figs. 8 a-c ; WALSINGHAM, p. 531, P. Z. S. 1891.

*Glyphipteryx grapholithoides*, Natal, WALSINGHAM, p. 116, pl. v, fig. 53, Tr. E. Soc. 1891, n. sp.

*Gracilaria fidella*, *falconipennella*, *phasianipennella*, season-dimorphism in ; HERING, S. E. Z. 1891, pp. 89, &c. *G. elongella* and *roscipennella*, distinctions of ; *id. t. c.* p. 95. *G. leuconota*, Z., generic position queried ; WALSINGHAM, p. 539, P. Z. S. 1891.

*G. punctulata*, Natal, p. 125, pl. vi, fig. 6c, *apicistrigata*, fig. 67, *bifasciata*, fig. 68, Gambia, p. 126, WALSINGHAM, Tr. E. Soc. 1891 ; *G. theivora*, Ceylon, WALSINGHAM, p. 49, Ind. Mus. Notes, ii ; *G. æneocapitella*, p. 539, *apicepunctella*, p. 540, St. Vincent, WALSINGHAM, P. Z. S. 1891 : n. spp.

*Gymnelema*, n. g., between *Melasina* and *Diplodoma*, for *G. rougemontii*, n. sp., Delagoa Bay ; HEYLAERTS, p. ccclxxv, C.R. Ent. Belg. xxxv.

*Gymnogramma hutchinsoni*, Natal, WALSINGHAM, p. 92, pl. iv, fig. 29, neuration and head figured, pl. vii, fig. 77, Tr. E. Soc. 1891.

*Heliodines marginata*, St. Vincent, WALSINGHAM, p. 535, P. Z. S. 1891, n. sp.

*Heliozela hammoniella*, Sorh., and *Tinagma betulæ*, St., are one species ; STANGE, p. 133, S. E. Z. 1891. *H. hammoniella*, Sorh., is *Tinagma betulæ*, St. ; STANTON, Ent. M. M. (2) ii, p. 299.

*Heydenia* (?) *novaki*, Dalmatia, REBEL, p. 635, Verh. z.-b. Wien, xli, n. sp.

*Hyponomeuta strigillatus*, Z., = (*perficitellus*, Wlk.) ; WALSINGHAM, p. 89, Tr. E. Soc. 1891. *H. confusellus*, Wkr., = (*Cryptolechia strigosella*, 1891. [VOL. XXVIII.]

Wkr.), and is transferred to *Psecadia*; *H. paucellus*, Wkr., is also a *Psecadia*, p. 527, *P. notatella*, Wkr., = (*xanthorrhoea*, Z.), *abraxasella*, Wkr., = (*aureocapicella*, Mschl.), p. 528; *id.* P. Z. S. 1891. *H. cognatella*, resistance of larva to cold; BUGNION, MT. Schw. ent. Ges. viii, p. 319.

*H. puncticornis*, Delagoa Bay, WALSINGHAM, p. 90, pl. iv, fig. 27, Tr. E. Soc. 1891; *H. rutila*, Araucania, BARTLETT-CALVERT, Ent. M. M. (2) ii, p. 316 (but see Zool. Rec. xxvii, Ins. p. 269) : n. spp.

*Ide complanella*, Gambia, WALSINGHAM, p. 113, pl. v, fig. 50, Tr. E. Soc. 1891, n. sp.

†*Idiopteryx*, n. g., for *Cryptolechia obliquella*, Wesm., WALSINGHAM, p. 104, with figs. of neurulation and head, pl. vii, fig. 81, Tr. E. Soc. 1890.

†*Ischnophanes*, n. g., near *Batrachedra*, for *I. monocentra*, n. sp., Biskra; MEYRICK, p. 60, Ent. M. M. (2) ii.

*Lampronia rubiella*, oviposition and autumnal larva noticed; CHAPMAN, Ent. M. M. (2) ii, pp. 169 & 198.

*Lampros* (*Ecophora*) *præditella*, Dalmatia, REBEL, p. 634, Verh. z.-b. Wien, xli, n. sp.

*Laverna gambiella*, Gambia, pl. v, fig. 54, *quinquecristata*, Natal, fig. 55, WALSINGHAM, Tr. E. Soc. 1891, p. 117, n. spp.

*Lecithocera marginata*, Gambia, p. 104, pl. v, fig. 39, *flavipalpis*, Natal, p. 105, fig. 40, WALSINGHAM, Tr. E. Soc. 1891, n. spp.

†*Licmocera*, n. g., *Nepticulinae*, neurulation and head figured, pl. vii, fig. 88, for *L. lyonetiella*, n. sp., Gambia, pl. vi, fig. 70; WALSINGHAM, p. 128, Tr. E. Soc. 1891.

*Lita crocipunctella*, St. Vincent, WALSINGHAM, p. 520, P. Z. S. 1891, n. sp.

*Lithocolletis*: synonymical list of the N. American species, with critical remarks; WALSINGHAM, Ins. Life, iii, pp. 325-329. *L. alni*, n. n. for *alnivorella*, Chamb., *fusciella*, n. n. for *unifasciella*; Chamb.; *id. t. c.* p. 326. *L. anderidae*, larva described; RICHARDSON, Ent. M. M. (2) ii, p. 22. *L. zulella*, Wlsm., queried as being an *Orymachæris*; WALSINGHAM, p. 130, Tr. E. Soc. 1891.

*L. idolias*, Algeria, MEYRICK, Ent. M. M. (2) ii, p. 61; *L. betulivora*, p. 326, *grindeliella*, p. 327, N. America, WALSINGHAM, Ins. Life, iii : n. spp.

*Mallobathra homalopa*, New Zealand, MEYRICK, p. 100, Tr. N. Z. Inst. xxiii, n. sp.

*Megacraspedus suffusellus*, Natal, WALSINGHAM, p. 109, pl. v, fig. 47, Tr. E. Soc. 1891, n. sp.

†*Micropostega*, n. g., *Nepticulinae*, neurulation and head figured, pl. vii, fig. 90, for *M. æneofusciata*, n. sp., Gambia, pl. vi, fig. 72; WALSINGHAM, p. 130, Tr. E. Soc. 1891.

*Micropteryx kaltenbachii*, on hornbeam; BARRETT, Ent. M. M. (2) ii, p. 21.

*M. caledoniella*, Scotland, GRIFFITH, Ent. M. M. (2) ii, p. 300, n. sp.

†*Microthauma*, n. g., *Lyonetiinae*, near *Opostega*, neurulation and head

figured, pl. vii, fig. 87, for *M. metallifera*, n. sp., Natal, pl. vi, fig. 69; WALSINGHAM, p. 127, Tr. E. Soc. 1891.

*Nemophora elongatella*, Wlsm., neuration noticed; WALSINGHAM, p. 87, Tr. E. Soc. 1891.

*Nemotois humilis*, Delagoa Bay, WALSINGHAM, p. 89, pl. iv, fig. 26, Tr. E. Soc. 1891, n. sp.

*Nepticula gei*, n. var., *semicolorella*; EPPELSHEIM, p. 351, S. E. Z. 1891.

*Nigilgia adjectella*, Wlk., referred to *Phycodes*, the genus being untenable; WALSINGHAM, p. 80, Tr. E. Soc. 1891.

*Nothris bryophilella*, Gambia, WALSINGHAM, p. 108, pl. v, fig. 46, Tr. E. Soc. 1891, n. sp.

*Odites*, n. g., p. 99, for a part of *Cryptolechia*, Z., neuration and head figured, pl. vii, fig. 80, and including *O. natalensis*, Natal, p. 102, pl. iv, fig. 36, *carterella*, *O. (?) inconspicua*, fig. 38, Gambia, p. 103, fig. 37, n. spp.; WALSINGHAM, Tr. E. Soc. 1891.

*Œcophora xenias*, Algeria, MEYRICK, Ent. M. M. (2) ii, p. 58, n. sp.

*Œla carteri*, Gambia, WALSINGHAM, p. 91, pl. iv, fig. 28, Tr. E. Soc. 1891; *Œ. siderea*, San Domingo, *id.* p. 533, P. Z. S. 1891 : n. spp.

*Oxymachæris*, n. g., *Nepticulinae*, neuration and head figured, pl. vii, fig. 89, for *O. niveocervina*, n. sp., Gambia, pl. vi, fig. 71; WALSINGHAM, p. 129, Tr. E. Soc. 1891.

*Phæosaces liochroa*, New Zealand, MEYRICK, p. 98, Tr. N. Z. Inst. xxiii, n. sp.

*Philobota virgo*, Natal, WALSINGHAM, p. 115, pl. v, fig. 52, Tr. E. Soc. 1891, n. sp.

*Phycodes punctata*, Natal, p. 78, pl. iii, fig. 18, *substriata*, Zanzibar, p. 79, pl. iv, fig. 19, *albitogata*, Gambia, p. 80, fig. 20, WALSINGHAM, Tr. E. Soc. 1891, n. spp.

*Plutella cruciferarum*, notes on; ARKLE, Ent. xxiv, pp. 256-260. *P. annulatella*, Curt., life-history; RICHARDSON, Ent. M. M. (2) ii, p. 317.

*Pœcilia extranea*, St. Vincent, WALSINGHAM, p. 521, P. Z. S. 1891, n. sp.

*Polyhymno*, Chamb., = (*Copocercia*, Z.), neuration described and figured, p. 95, pl. vii, fig. 78, WALSINGHAM, Tr. E. Soc. 1891.

*P. cleodorella*, p. 95, pl. iv, fig. 32, *P. (?) tenuis*, p. 96, fig. 33, Gambia, WALSINGHAM, Tr. E. Soc. 1891; *P. (?) godmani*, St. Vincent, WALSINGHAM, p. 525, P. Z. S. 1891 : n. spp.

*Psecadia delliiella*, Texas, FERNALD, p. 30, Canad. Ent. xxiii, n. sp.

*Pyroderces simplex*, Gambia, WALSINGHAM, p. 119, pl. vi, fig. 58, Tr. E. Soc. 1891, n. sp.

*Sagephora steropastis*, New Zealand, MEYRICK, p. 100, Tr. N. Z. Inst. xxiii, n. sp.

*Scalidomia*, n. g., *Euplocamine*; type, *Tinea horridella*, Wlk., WALSINGHAM, p. 83, with fig. of neuration and palpi, pl. vii, fig. 75, Tr. E. Soc. 1891.

✓*Sciopetris*, n. g., near *Talaporia*, for *S. technica*, n. sp., Algeria, MEY-RICK, p. 58, Ent. M. M. (2) ii.

*Setomorpha rutella*, Z., neuration described and figured, p. 81, pl. vii, fig. 73; WALSINGHAM, Tr. E. Soc. 1891.

*Stigmatophora rosmarinella*, Cannes, WALSINGHAM, Ent. M. M. (2) ii, p. 139; *S. fasciata*, p. 118, pl. vi, fig. 56, *distincta*, fig. 57, p. 119, Gambia, WALSINGHAM, Tr. E. Soc. 1891 : n. spp.

*Stathmopoda maculata*, p. 120, pl. vi, fig. 59, *crassella*, fig. 60, *divisa*, fig. 61, p. 121, WALSINGHAM, Tr. E. Soc. 1891, n. spp.

*Strobisia*, Clem., neuration described and figured, WALSINGHAM, p. 97, pl. vii, fig. 79, Tr. E. Soc. 1891.

*S. metallica*, Gambia, WALSINGHAM, p. 97, pl. iv, fig. 34, Tr. E. Soc. 1891, n. sp.

*Symmoca sparsella*, Beyrout, JOANNIS, p. lxxxiv, Bull. Soc. Ent. Fr. 1891, n. sp.

*Tamarrha gelidella* and *nivosella*, Wkr., referred to *Psecadia*; WALSINGHAM, p. 528, P. Z. S. 1891.

*Timyra extranea*, Gambia, WALSINGHAM, p. 105, pl. v, fig. 41, and pl. vii, fig. 83, Tr. E. Soc. 1891, n. sp.

*Tinea granulatella*, H. S., validity and characters discussed; REBEL, pp. 624-626, Verh. z.-b. Wien, xli. *T. horridella*, Wlk., cf. *Scalidomia*.

*T. zebra*, Cape Colony, WALSINGHAM, p. 86, pl. iv, fig. 24, Tr. E. Soc. 1891; *T. plumella*, St. Vincent, *id.* p. 508, P. Z. S. 1891 : n. spp.

*Tischeria* : synonymical list of the N. American species, with table of their characters; WALSINGHAM, Ins. Life, iii, pp. 387-389.

*Topeutis drucella*, Wlsm., referred to *Anchinia*; WALSINGHAM, p. 114, Tr. E. Soc. 1891.

*Tortyra auriferalis*, Wkr., = (*Simæthis aurofasciana*, Snell., and *Choregia ignita*, Z.); WALSINGHAM, p. 529, P. Z. S. 1891.

✓*Trapeziophora*, n. g. *Glyphipteryginae*, p. 529, for *T. gemmula*, n. sp., St. Vincent, p. 530, with details of sculpture, pl. xli, figs. 7a, b; WALSINGHAM, P. Z. S. 1891.

*Trichostibas iophlebia*, Z., generic position queried; WALSINGHAM, p. 534, P. Z. S. 1891.

*Trichotaphe trigonella*, St. Vincent, WALSINGHAM, p. 523, P. Z. S. 1891, n. sp.

*Xystophora striatopunctella* (Koll. i. l.), Dalmatia, p. 630, *retusella*, Brussa, p. 632, REBEL, Verh. z.-b. Wien, xli, n. spp.

*Ypselophus straminis*, Wlsm., referred to *Anorthosia*; WALSINGHAM, p. 110, Tr. E. Soc. 1891.

*Y. gigas*, Natal, p. 107, pl. v, fig. 43, *marmoratus*, Gambia, p. 108, fig. 44, WALSINGHAM, Tr. E. Soc. 1891; *Y. rusticus*, p. 525, St. Vincent and Texas, *piperatus*, *indignus*, St. Vincent, p. 126, WALSINGHAM, P. Z. S. 1891 : n. spp.

*Zurathra muricicoma*, Gambia, WALSINGHAM, p. 125, pl. vi, fig. 65, Tr. E. Soc. 1891; *Z. insulella*, St. Vincent, WALSINGHAM, p. 538, P. Z. S. 1891 : n. spp.

## AGDISTIDÆ, PTEROPHORIDÆ.

[Cf. CHRÉTIEN (149), HAMPSON (369), HERING (388), MEYRICK (585), WALSINGHAM (918, 919).]

*Aciptilia actinodactyla*, Charente, CHRÉTIEN, Le Nat. 1891, p. 99, n. sp.

√ *Atomopteryx*, n. g., *Agdistidæ*, for *A. doeri*, n. sp., Petropolis ; WALSINGHAM, p. 216, Ent. M. M. (2) ii.

√ *Gilbertia*, n. g., *Pterophoridae*, for *G. eques*, n. sp., W. Africa ; WALSINGHAM, p. 259, Ent. M. M. (2) ii.

√ *Koremaguia*, n. g., *Pterophoridae*, for *K. aurantidactylus*, n. sp., S. India, pl. clvi, fig. 20 ; HAMPSON, p. 142, Ill. Lep. Het. viii.

√ *Ochyrotica*, n. g., *Agdistidæ*, p. 217, for *O. fasciata*, n. sp., S. and Central America, p. 218 ; WALSINGHAM, Ent. M. M. (2) ii.

*Oxyptilus tristis*, metamorphoses ; HERING, p. 223, S. E. Z. 1891.

*Pterophorus plagiodactylus*, metamorphoses described and figured ; SEPP, Nederl. Ins. (2) iv, pp. 188-195, pl. xxxiv.

*P. probolias*, Algeria, MEYRICK, Ent. M. M. (2) ii, p. 12, n. sp.

*Scoptonoma tipuloides*, Trinidad, WALSINGHAM, p. 493, P. Z. S. 1891, n. sp.

*Sochchora donatella*, genus redescribed, species noticed ; WALSINGHAM, Ent. M. M. (2) ii, p. 243.

√ *Steganodactyla*, n. g., *Agdistidæ*, for *S. concursa*, Ceylon, p. 241, *connexiva*, Pegu, p. 242 ; WALSINGHAM, Ent. M. M. (2) ii.

√ *Uroloba*, n. g., *Pterophoridae*, p. 261, for *U. fuscicostata*, n. sp., Valparaiso, p. 262 ; WALSINGHAM, Ent. M. M. (2) ii.

*Utuca ochracealis*, Wkr., genus and species redescribed ; WALSINGHAM, Ent. M. M. (2) ii, pp. 260 & 261.

(D.) *DIPTERA.*

[*Cf.* AARON, WEEKS, & BEUTENMÜLLER (1), ARRIBALZAGA (15, 16, 17), BECKER (44, 45), BEZZI (63), BIGOT (64-71), BLANCHARD (79, 80), BRISCHKE (96), BRUNETTI (106), COQUILLETT (155-158), DUNCKER (219), ENOCK (245), GARMAN (320), GIGLIO-TOS (329-334), HUDSON & SKUSE (425), HURST (430), KIEFFER (464, 465), KOWARZ (485), LAMPA (511), LEVI-MORENOS (527), LOWNE (544), MARLATT (563), MEADE (571, 572), MIALl (586), MIK (589-593), OLLIFF (636), OSTEN-SACKEN (642), RÖDER (740, 741), RÜBSAAMEN (753-757), SKUSE (815), SNOW (832), THEOBALD (856), TOURNIER (861), TOWNSEND (862-873), VERHOEFF (891, 895, 902), WEBSTER (943), WILLISTON (337, 965), WULP (337).]

Brief note relative to classification of *Diptera*; BRAUER, Verh. z.-b. Wien, xli, SB. pp. 36 & 37.

Classification of the *Orthorrhapha* discussed; the families arranged in three groups—*Nemocera*, *Nemocera anomala*, *Eremochæta*; OSTEN-SACKEN, Ent. M. M. (2) ii, p. 35.

Catalogue of Oriental *Diptera*, part 1; BIGOT, J. A. S. B. lx, pp. 250-282. Extending from *Culicidæ* to *Cyrtidæ*.

Some *Diptera* in caverns; RÖDER (740).

Points of interest in the biology of aquatic larvæ of *Diptera*; MIALl (586).

List of the writings of J. MIK, and alphabetical index of the species mentioned in them; Wien. ent. Z. x, pp. 65-96.

The New Zealand luminous larva, habits, &c.; HUDSON, Ent. xxiv, pp. 26-29.

Introductory papers on British *Diptera*; BRUNETTI (106).

## CECIDOMYIDÆ.

Notes on the British genera and species; THEOBALD, Account Brit. Flies, pp. 38-91.

The Cecidomyid galls found on *Vaccinium*, pp. 142-148; on *Scrophularia nodosa*, *Carpinus betulus*, and *Populus tremula*, pp. 148-150; RÜBSAAMEN, Z. Naturw. lxiv. Cecidomyid gall on *Euphorbia cyparissias* noticed; MIK, p. 1, Wien. ent. Z. x. Cecidomyid gall on *Biscutella saxatilis* described and figured; *id.* p. 309, pl. iv, t. c. Cecidomyid galls of Lorraine; KIEFFER, Feuille. Nat. xxi, pp. 181, &c.

Zoophagous Cecidomyid larvæ; RÜBSAAMEN, Wien. ent. Z. x, pp. 6, &c.

*Cecidomyia pseudococcus*, larva noticed ; MIK, p. 2, Wien. ent. Z. x. *C. tuberculi*, ♂ described, p. 134 ; *C. betulæ*, Wtz., referred to *Hormomyia*, and larva and pupa described, p. 137 ; RÜBSAAMEN, Z. Naturw. lxiv. *C.* sp., larva eating rust on wheat and flax in Australia ; COBB & OLLIFF, pp. 67–69, Agric. Gaz. N.S.W. *C. destructor*, notes on ; ORMEROD, Rep. 1890, pp. 32–39 : number of broods, &c. ; WEBSTER, pp. 63–79, Bull. Dep. Agric. Ent. No. 23 : life-history ; ENOCK (245) : additional notes, life-history ; FORBES, Rep. xvii, pp. 54–64 : living on grasses, variation in the number of joints of the antennæ ; RILEY & HOWARD, Ins. Life, iii, p. 306. *C. leguminicola*, notes on ; ORMEROD, Rep. 1890, p. 23. *C. (Diplosis) tritici*, metamorphoses, parasites, &c. ; LAMPA, Ent. Tidskr. xii, pp. 113–135, pl. vi.

*C. rubicundula*, Germany, RÜBSAAMEN, p. 131, Z. Naturw. lxiv ; *C. kiefferiana*, Westphalia, id. B. E. Z. xxxvi, p. 5, pl. i, fig. 2 ; *C. crinita*, Westphalia, id. p. 45, t. c. ; *C. lupulina*, p. 233, *clavifer*, *pulvini*, p. 238, *karschi*, p. 239, Germany, KIEFFER, Ent. Nachr. xvii : n. spp.

*Diplosis sphaerothecæ*, larva figured and noticed, p. 141, pl. iii, fig. 15 ; RÜBSAAMEN, Z. Naturw. lxiv.

*D. hypochæridis*, Westphalia, RÜBSAAMEN, B. E. Z. xxxvi, pp. 1 & 52 ; *D. senecionis*, Westphalia, p. 43, *minima*, Germany, p. 50, RÜBSAAMEN, t. c. ; *D. aphidisuga*, p. 8, pl. i, fig. 1, *aphidivora*, p. 14, Westphalia ; RÜBSAAMEN, Wien. ent. Z. x ; *D. stercoraria*, p. 125, *acetosellæ*, p. 128, Germany, RÜBSAAMEN, Z. Naturw. lxiv : n. spp.

*Hormomyia poæ*, Bosc., ♂ described ; RÜBSAAMEN, p. 135, Z. Naturw. lxiv.

*Lasioptera rubi*, sexual characters ; RÜBSAAMEN, Z. Naturw. lxiv, p. 152.

*Schizomyia sociabilis*, Rübs., ♂ characters described and figured ; RÜBSAAMEN, p. 151, Z. Naturw. lxiv.

#### MYCETOPHILIDÆ.

*Neoglaphyroptera immaculata*, Piedmont, GIGLIO-TOS, p. 8, No. 94, Boll. Mus. Zool. Tor. vi, n. sp.

*Opistholoba*, n. g., for *Mycetophila caudata*, Staeg. ; MIK, pp. 5 & 191, Wien. ent. Z. x.

*Bolitophila luminosa*, New Zealand, SKUSE, P. Linn. Soc. N.S.W. (2) v, p. 678 ; *B. luminosa* (the New Zealand glow-worms, habits and early stages described by HUDSON), SKUSE, pp. 47 & 48, pl. viii, Tr. N. Z. Inst. xiii : n. sp.

Larva allied to *Sciara*, from Mammoth Cave, described and figured ; GARMAN, Bull. Ess. Inst. xxiii, pp. 136–140, pl. i.

*Sciara ligniperda*, *socialis*, Danzig, BRISCHKE, Schr. Ges. Danz. (2) vii, pt. 4, p. 27 ; *S. tristis*, W. Africa, BIGOT, p. 366, Ann. Soc. Ent. Fr. 1891 : n. spp.

#### SIMULIIDÆ.

*Simulium occidentale*, New Mexico, TOWNSEND, Psyche, vi, p. 107 n. sp.

## BLEPHAROCERIDÆ.

*Hammatorhina bella*, Lw., problematic larva noticed ; GAHAN, P. E. Soc. 1891, p. ii.

## CULICIDÆ, CHIRONOMIDÆ.

Monograph of the Argentine *Culicidæ*, with general discussion on and anatomy ; ARRIBALZAGA (15).

*Chironomus* : nature of food of larva discussed ; LEVI-MORENOS (527).

†*Heteronychia*, n. g., p. 155, for *H. dolosa*, n. sp., Buenos Ayres, p. 156 ; ARRIBALZAGA, Rev. Mus. la Plata, ii.

†*Janthinosoma*, n. g., p. 152, for *Culex discrucians*, Wlk. (figured, pl. iv, fig. 6), and including *J. (?) oblita*, n. sp., Buenos Ayres, p. 154 ; ARRIBALZAGA, Rev. Mus. la Plata, ii.

*Megarhina separata*, Chaco, ARRIBALZAGA, Rev. Mus. la Plata, ii, p. 133, n. sp.

*Psorophora holmbergii*, Chaco, ARRIBALZAGA, Rev. Mus. la Plata, ii, p. 142, n. sp.

†*Ochlerotatus*, n. g., p. 143, for *O. confirmatus*, n. sp., Buenos Ayres, p. 146, and including *Culex albifuscatus*, Macq. ; ARRIBALZAGA, Rev. Mus. la Plata, ii.

†*Tæniorhynchus*, n. g., p. 147, for *Culex tæniorhynchus*, Wied., and *T. confinnis* (sic), Chaco, p. 149, *fasciolatus*, Buenos Ayres, p. 150, n. spp. ; ARRIBALZAGA, Rev. Mus. la Plata, ii.

†*Uranotenia*, n. g., p. 163, for *U. nataliæ*, p. 164, *pulcherrima*, p. 165, pl. iv, fig. 4, n. spp., Buenos Ayres ; ARRIBALZAGA, Rev. Mus. la Plata, ii.

*Culex* sp., life-history ; HURST (430). *C. pipiens*, larva as an internal parasite ; BLANCHARD, p. 42, Monit. Zool. Ital. ii, and Bull. Soc. Z. Fr. xvi, p. 72.

## PSYCHODIDÆ.

*Pericoma fusca*, Macq., is ♂ of *P. calceata* ; EATON, p. xxv, P. E. Soc. 1891.

## TIPULIDÆ and RHYPHIDÆ.

*Ptychopteridæ* : systematic position noticed ; BRAUER, p. 37, Verh. z.-b. Wien, xli.

*Rhyphus polytæniatus*, W. Africa, BIGOT, p. 366, Ann. Soc. Ent. Fr. 1891, n. sp.

## XYLOPHAGIDÆ.

*Subula varicolor*, Canary Is., BIGOT, p. 276, Bull. Soc. Z. Fr. xvi, n. sp.



## STRATIOMYIIDÆ.

*Acanthina* (?) *bellardii*, Mexico, GIGLIO-TOS, No. 102, Boll. Mus. Zool. Tor. 1891, n. sp.

*Berismyia*, n. g., near *Beris*, for a nondescript Mexican species; GIGLIO-TOS, No. 108, Boll. Mus. Zool. Tor. 1891.

*Clitellaria stigma*, Mexico, GIGLIO-TOS, No. 102, Boll. Mus. Zool. Tor. 1891, n. sp.

*Cyphomya ochracea*, Mexico, GIGLIO-TOS, No. 102, Boll. Mus. Zool. Tor. 1891, n. sp.

*Euparyphus carbonarius*, Mexico, GIGLIO-TOS, No. 102, Boll. Mus. Zool. Tor. 1891, n. sp.

*Heteracanthia mexicana*, Mexico, GIGLIO-TOS, Boll. Mus. Zool. Tor. 1891, No. 102, n. sp.

*Merosargus hyalopterus*, *dissimilis*, *orizaba*, *coriaceus*, Mexico, GIGLIO-TOS, No. 102, Boll. Mus. Zool. Tor. 1891, n. spp.

*Microchrysa nova*, Mexico, GIGLIO-TOS, No. 102, Boll. Mus. Zool. Tor. 1891, n. sp.

*Nemotelus nigroæneus*, I. of Norderney, VERHOEFF, p. 3, Ent. Nachr. xvii, n. sp.

*Ptecticus trivittatus*, Mexico, GIGLIO-TOS, No. 102, Boll. Mus. Zool. Tor. 1891, n. sp.

*Sargus filiformis*, Mexico, GIGLIO-TOS, Boll. Mus. Zool. Tor. 1891, No. 102, n. sp.

*Stratiomyia* and *Stratiomys*, orthographical note; MIK, p. 192, Wien. ent. Z. x.

## TABANIDÆ.

Table of characters of the genera, with critical remarks on many; BIGOT, Mém. Soc. Zool. iv, pp. 408-419.

*Atylotus notarum*, p. 367, *combustus*, *hypoleucus*, p. 368, W. Africa, BIGOT, Ann. Soc. Ent. Fr. 1891; *A. melanognathus*, p. 204, *laotianus*, p. 205, Laos, BIGOT, N. Arch. Mus. (3) ii : n. spp.

*Bellardia* : bibliographic note on; MIK, p. 59, Wien. ent. Z. x.

*B. nigrotecta*, Laos, BIGOT, p. 204, N. Arch. Mus. (3) ii, n. sp.

*Hæmatopota* : table of characters of species of; BIGOT, pp. 74-79, Bull. Soc. Z. Fr. xvi.

*H. cordigera*, W. Africa, BIGOT, p. 369, Ann. Soc. Ent. Fr. 1891; *H. ? cilipes*, p. 205, *pachycera*, p. 206, Laos, BIGOT, N. Arch. Mus. (3) ii; *H. cordigera*, E. India, *guineensis*, W. Africa, p. 76, *rufipennis*, *tristis*, Japan, p. 77, *indiana*, *limbata*, Bengal, p. 78, *punctifera*, Java, p. 79, BIGOT, Bull. Soc. Z. Fr. xvi : n. spp.

*Sackenymyia semilivida*, W. Africa, BIGOT, p. 366, Ann. Soc. Ent. Fr. 1891, n. sp.

*Tabanus leucosparsus*, Laos, BIGOT, p. 203, N. Arch. Mus. (3) ii, n. sp.

## LEPTIDÆ, ASILIDÆ.

Catalogue of the S. American *Asilidæ*; WILLISTON, Tr. Am. Ent. Soc. xviii, pp. 67-91.

*Theromyia*, n. n. for *Cylindrophora*, Phil.; WILLISTON, p. 73, Tr. Am. Ent. Soc. xviii.

*Agnotomyia* and *Triptotricha*, characters of; TOWNSEND, P. E. Soc. Wash. ii, p. 117.

*Alcimus æthiopicus*, W. Africa, BIGOT, p. 371, Ann. Soc. Ent. Fr. 1891, n. sp.

*Chrysopyla fulvida*, W. Africa, BIGOT, p. 370, Ann. Soc. Ent. Fr. 1891, n. sp.

*Laphria bipenicillata*, W. Africa, BIGOT, p. 370, Ann. Soc. Ent. Fr. 1891, n. sp.

*Ommatius pallidapex*, W. Africa, BIGOT, p. 372, Ann. Soc. Ent. Fr. 1891; *O. lividipes*, Simla, BIGOT, p. 138, P. A. S. B. 1890: n. spp.

*Philodicus rufiventris*, Laos, BIGOT, p. 207, N. Arch. Mus. (3) ii, n. sp.

*Rhadiurgus notatus*, W. Africa, BIGOT, p. 371, Ann. Soc. Ent. Fr. 1891, n. sp.

## BOMBYLIIDÆ, MIDAIDÆ.

*Amphicosmus elegans*, California, COQUILLETT, p. 220, West Am. Sci. vii, n. sp.

*Aphæbantus*: revision of the species; COQUILLETT, pp. 254-264, West Am. Sci. vii.

*A. varius*, p. 256, *pavidus*, p. 257, *tardus*, *marcidus*, p. 258, *mixtus*, *interruptus*, p. 259, *scriptus*, p. 260, *desertus*, *capax*, p. 261, *abnormis*, p. 262, *squamosus*, *fumidus*, p. 263, *brevistylus*, p. 264, California, COQUILLETT, West Am. Sci. vii, n. spp.

*Argyramæba sinuata*, parasitism and larva described; VERHOEFF, pp. 40-57, Verh. Ver. Rheinl. xlviii.

*Bombylius cincinnatus*, Zermatt, BECKER, p. 294, Wien. ent. Z. x, n. sp.

*Lordotus junceus*, *diversus*, California, COQUILLETT, p. 198, West Am. Sci. vii, n. spp.

*Metacosmus*, n. g. (*Bombyliidæ*), p. 220, for *M. exilis*, n. sp., California, p. 221; COQUILLETT, West Am. Sci. vii.

*Paracosmus insolens*, California, COQUILLETT, p. 221, West Am. Sci. vii, n. sp.

*Raphiomidas acton*, California, COQUILLETT, p. 85, West Am. Sci. vii, n. sp.

*Toxophora vasta*, California, COQUILLETT, p. 199, West Am. Sci. vii, n. sp.

## THEREVIDÆ, EMPIDÆ.

*Anthepiscopus*, n. g. (*Empidæ*), p. 281, for *A. ribesii*, p. 282, pl. iii, figs. 1-3, *cælebs*, p. 283, n. spp., Tyrol; BECKER, Wien. ent. Z. x.

*Chersodromyia ornatipes*, Canary Is., BIGOT, p. 277, Bull. Soc. Z. Fr. xvi, n. sp.

*Hilarimorpha* : does not belong to *Leptides* ; BIGOT, p. xv, Bull. Soc. Z. Fr. 1891.

*Parathalassius*, n. g. (*Empidæ*), p. 216, for *P. blasigii*, n. sp., Venice, p. 217 ; MIK, Wien. ent. Z. x.

*Rhamphomyia discoidalis*, ♂ described ; BECKER, p. 293, Wien. ent. Z. x.

*Steleocheta stiriensis*, S. Tyrol, BECKER, p. 284, Wien. ent. Z. x, n. sp.

*Symballophthalmus* (sub *Platypalpus*) *cyanophthalmus*, Strobl, = (*pictipes*, Becker) ; STROBL, p. 267, Wien. ent. Z. x.

*Syneches* sp., habits ; SCHWARZ, P. E. Soc. Wash. ii, p. 146.

*Thereva* (*Dialineura*) *microcephala*, ♂ described ; RÖDER, p. 17, Z. Ent. Bresl. (n.s.) xvi.

#### DOLICHOPODIDÆ.

*Aphantotinus*, Wheeler, is probably *Thrypticus*, Gerst. ; MIK, p. 4, Wien. ent. Z. x.

*Argyra flabellifera*, Tyrol, BECKER, p. 285, Wien. ent. Z. x, n. sp.

*Epithalassius*, n. g., p. 186, for *E. sancti-marci*, n. sp., Venice, pp. 187 & 193 ; MIK, Wien. ent. Z. x.

*Gymnopternus pœnitens*, Wh., referred to *Hercostomus* ; MIK, p. 4, Wien. ent. Z. x.

*Peleoropeodes* : systematic position noticed ; MIK, p. 3, Wien. ent. Z. x.

*Psilopodius fulvocinctus*, p. 372, *lævis*, p. 373, W. Africa, BIGOT, Ann. Soc. Ent. Fr. 1891, n. spp.

*Sphyrrotarsus hygrophilus*, Tyrol, BECKER, p. 286, Wien. ent. Z. x, n. sp.

*Xiphandrium breviseta*, p. 289, pl. iii, figs. 6 & 7, *albomaculatum*, p. 291, Switzerland, BECKER, Wien. ent. Z. x, n. spp.

#### SYRPHIDÆ.

Critical enumeration of the Central American *Syrphidæ* ; WILLISTON, Biol. Centr. Am. Dipt. iii.

✓ *Argentinomyia*, n. g. (*Psarini*), for *A. testaceipes*, n. sp., Buenos Ayres ; ARRIBALZAGA, p. 199, An. Soc. Arg. xxxii.

*Baccha vulpiana* = (*tricincta*, Wulp), Tucuman, ARRIBALZAGA, An. Soc. Arg. xxxii, p. 250 ; *B. rubida*, pl. i, fig. 8, *gracilis*, p. 34, *nasuta*, *attenuata*, p. 35, *punctifrons*, *laudabilis*, p. 36, *dolosa*, pl. i, fig. 7, *lugubris*, *ænea*, pl. i, fig. 10, p. 37, *cærulea*, *concinna*, p. 38, Mexico, WILLISTON, Biol. Centr. Am. Dipt. iii : n. spp.

*Chilosia chrysochlamys*, pl. i, fig. 4, *sororia*, p. 8, *sororcula*, p. 9, Mexico, WILLISTON, Biol. Centr. Am. Dipt. iii, n. spp.

*Chrysotoxum* : monograph of the European species ; GIGLIO-TOS, Atti Acc. Tor. xxvi, pp. 134-165, pl. ii. *C. arcuatum*, Panz., = (*lubricum*, Giglio-Tos) ; GIGLIO-TOS, p. 7, Boll. Mus. Zool. Tor. vi, No. 94.

*C. lessonæ*, p. 144, *lubricum*, p. 151, *sackeni*, p. 152, *bigoti*, p. 154, *fuscum*, p. 160, Piedmont, GIGLIO-TOS, Atti Acc. Tor. xxvi, and Boll. Mus. Zool. Tor. vi, No. 94, n. spp.

*Copestylum limbipenne*, figured, pl. ii, fig. 2; Biol. Centr. Am. Dipt. iii.

*Didea coquillettii*, Mexico, WILLISTON, p. 19, pl. i, fig. 9, Biol. Centr. Am. Dipt. iii, n. sp.

*Eristalomyia rufo-nasuta*, W. Africa, BIGOT, p. 375, Ann. Soc. Ent. Fr. 1891; *E. eunotata*, Laos, *id.* p. 208, N. Arch. Mus. (3) ii: n. spp.

<sup>†</sup>*Holmbergia*, n. g., p. 195, for *H. guntherii*, n. sp., Buenos Ayres, p. 197; ARRIBALZAGA, An. Soc. Arg. xxxii.

<sup>‡</sup>*Megametopon*, n. g., near *Volucella*, for a nondescript Mexican insect; GIGLIO-TOS, No. 108, Boll. Mus. Zool. Tor. 1891.

*Melanostoma gymnocera*, W. Africa, BIGOT, p. 375, Ann. Soc. Ent. Fr. 1891; *M. catabombum*, *crenulatum*, pl. i, fig. 5, p. 12, *rugosonasmus*, Mexico, *melanocerus*, Costa Rica, p. 13, WILLISTON, Biol. Centr. Am. Dipt. iii: n. spp.

*Mesogramma*, to be used in place of *Mesograptæ*, Lw.; several Central American species described; WILLISTON, pp. 24-28, Biol. Centr. Am. Dipt. iii.

*Microdon mutabilis*, mode of its sound-production; BIGNELL, Ent. M. M. (2) ii, p. 225. *M. aurifex*, figured, pl. i, fig. 2, noticed, p. 2; WILLISTON, Biol. Centr. Am. Dipt. iii.

*M. niger*, Mexico, WILLISTON, p. 4, pl. i, fig. 3, Biol. Centr. Am. Dipt. iii; *M. macquarti*, Uruguay, *rubriventris*, p. 128, *bonariensis*, p. 194, Buenos Ayres, ARRIBALZAGA, An. Soc. Arg. xxxii: n. spp.

*Mixogaster bellula*, Mexico, WILLISTON, p. 1, pl. i, fig. 1, Biol. Centr. Am. Dipt. iii, n. sp.

*Myiolepta auricaudata*, Mexico, WILLISTON, p. 40, pl. i, fig. 11, Biol. Centr. Am. Dipt. iii, n. sp.

*Ocyptamus fuscicosta*, Buenos Ayres, ARRIBALZAGA, An. Soc. Arg. xxxii, p. 255, n. sp.

<sup>‡</sup>*Omegasyrphus*, n. g., for a nondescript Mexican insect; GIGLIO-TOS, No. 108, Boll. Mus. Zool. Tor. 1891.

<sup>‡</sup>*Ophromyia*, n. g., near *Syrphus*, for *O. nasica*, n. sp., Mexico, pl. ii, fig. 1; WILLISTON, p. 55, Biol. Centr. Am. Dipt. iii.

*Phalacromyia pulchra*, p. 41, *bellula*, *virescens*, p. 42, Central America, WILLISTON, Biol. Centr. Am. Dipt. iii, n. spp.

*Pipiza* (*Pipizella*) *bellula*, Mexico, WILLISTON, p. 6, Biol. Centr. Am. Dipt. iii, n. sp.

<sup>‡</sup>*Rhopalosyrphus*, n. g., near *Myogaster*, for a nondescript Mexican insect; GIGLIO-TOS, No. 108, Boll. Mus. Zool. Tor. 1891.

*Salpingogaster limbipennis*, Mexico, WILLISTON, p. 29, Biol. Centr. Am. Dipt. iii, n. sp.

*Simoides trichopus*, p. 373, *pallidibasis*, p. 374, W. Africa, BIGOT, Ann. Soc. Ent. Fr. 1891, n. spp.

*Sphærophoria picticauda*, Big., and some unnamed species described; WILLISTON, Biol. Centr. Am. Dipt. iii, pp. 21 & 22.

*Syrphus tarsalis*, note on ; RÖDER, Z. Ent. Bresl. (n.s.) xvi, p. 20.

*S. zetterstedti*, Bonn, VERHOEFF, p. 360, Ent. Nachr. xvii ; *S. diversus*, p. 16, pl. i, fig. 6, *bisinuatus*, p. 17, *decipiens*, p. 18, Mexico, WILLISTON, Biol. Centr. Am. Dipt. iii : n. spp.

*Volucella lata*, Wied., characters and synonymy noticed, pp. 45 & 46 ; *picta* = (*pulchripes*, Big.), variation described, p. 47 ; *chaetophora*, Willist., figured, pl. i, fig. 15 ; WILLISTON, Biol. Centr. Am. Dipt. iii. *V. fasciata*, habits ; SMITH, Canad. Ent. xxiii, p. 242.

*V. quadrata*, pl. i, fig. 12, p. 46, *fraudulenta*, fig. 13, p. 48, *ornata*, *cæsariata*, p. 49, *opinator*, pl. i, fig. 14, p. 51, *comastes*, p. 52, Mexico, WILLISTON, Biol. Centr. Am. Dipt. iii, n. spp.

### CONOPIDÆ, CESTRIDÆ.

*Conops nitidulus*, W. Africa, BIGOT, p. 375, Ann. Soc. Ent. Fr. 1891, n. sp.

*Gastrophilus equi*, notes on ; ORMEROD, Rep. 1890, pp. 64-71.

*Hypoderma bovis*, notes on ; ORMEROD, Rep. 1890, p. 106.

### MUSCIDÆ CALYPTRATÆ.

*Muscidæ calyptrata*, notes on the families found in N. America ; TOWNSEND, P. E. Soc. Wash. pp. 89-100.

Note on the classification of *Anthomyiidae* ; BIGOT, p. cxxiv, Bull. Soc. Ent. Fr. 1891, and VERRALL, t. c. pp. cxxxiii & cxxxiv.

The genera and species of *Tachinidæ* found in Britain, tabulated and annotated ; MEADE (572).

*Acronacantha*, n. g. (*Deziinæ*), for *A. nubilipennis*, n. sp., Costa Rica, pl. v, fig. 12 ; WULF, p. 243, Biol. Centr. Am. Dipt. ii.

*Aphria ocypterata*, N. America, TOWNSEND, p. 361, Tr. Am. Ent. Soc. xviii, n. sp.

*Arthrocheta*, Br. and Berg., note on ; TOWNSEND, p. 382, Tr. Am. Ent. Soc. xviii.

*Atrophopoda*, n. g., near *Eggeria*, p. 373, for *A. singularis*, n. sp., Illinois, p. 374 ; TOWNSEND, Tr. Am. Ent. Soc. xviii.

*Bathydexia*, n. g. (*Deziinæ*), p. 222, for *B. albolineata*, n. sp., Costa Rica, p. 223, including also *Phorostoma appendiculata*, Big. ; WULF, Biol. Centr. Am. Dipt. ii.

*Brachymera*, Br. Bg., characters and composition discussed ; MIK, p. 210, Wien. ent. Z. x.

*Crossocosmyia*, Mik : note on the validity of the genus ; BIGOT, p. xv, Bull. Soc. Ent. Fr. 1891 : the use of the name discussed ; *id.* p. cxcv, t. c.

*Cenosia pachypoda*, W. Africa, BIGOT, p. 380, Ann. Soc. Ent. Fr. 1891, n. sp.

*Calodexia*, n. g., for *C. majuscula*, pl. vi, fig. 12, p. 257, *calceata*, *obscuripes*, p. 258, n. spp., Mexico ; WULF, Biol. Centr. Am. Dipt. ii.

√ *Camarona*, n. g. (*Dexiinae*), for *C. xanthogastra*, pl. v, fig. 11, p. 241, *cæruleonigra*, p. 242, n. spp., Mexico; WULP, Biol. Centr. Am. Dipt. ii.

√ *Ceratomyiella*, n. g., *Phytoinae*, p. 379, for *C. conica*, n. sp., Illinois, p. 380; TOWNSEND, Tr. Am. Ent. Soc. xviii.

√ *Chætona*, n. g. (*Dexiinae*), for *C. congrua*, n. sp., Mexico, and including *Dexia longiseta*, Wied., which is figured, pl. vi, fig. 8; WULP, Biol. Centr. Am. Dipt. ii.

*Chetogena tricolor*, W. Africa, BIGOT, p. 377, Ann. Soc. Ent. Fr. 1891, n. sp.

*Chiastocheta* (*Aricia*) *trollii*, notes on; RÖDER, Ent. Nachr. xvii, pp. 228-230.

*Cholomyia inaequipes*, Big., redescribed and figured; WULP, p. 247, pl. vi, fig. 1, Biol. Centr. Am. Dipt. ii.

*Chrysomya obscura*, W. Africa, BIGOT, p. 370, Ann. Soc. Ent. Fr. 1891, n. sp.

*Cinochira*: a valid genus, distinctive characters; SINTENIS, p. 143, Wien. ent. Z. x.

*Cistogaster occidua*, Wlk., = (*divisa*, Lw.); TOWNSEND, p. 142, P. E. Soc. Wash. ii.

*C. pallasii*, N. America, TOWNSEND, p. 142, P. E. Soc. Wash. ii, n. sp.

*Compsoomyia macellaria*, habits; WEED, Canad. Ent. xxiii, p. 243.

√ *Comyops*, n. g., near *Morinia*, for *C. nigripennis*, pl. vi, fig. 15, *striatocollis*, n. spp., Mexico; WULP, p. 262, Biol. Centr. Am. Dipt. ii.

*Cordyligaster minuscula*, Mexico, WULP, p. 252, pl. vi, fig. 7, Biol. Centr. Am. Dipt. ii, n. sp.

*Cyrtoneura pabulorum*: mode of escape from nests of *Bombus*; VERHOEFF, pp. 74-77, Verh. Ver. Rheinl. xlviii.

*Degeeria* (sub *Oplisa nigrifacies*, Big., = (*longipes*, Wulp); WULP, p. 264, Biol. Centr. Am. Dipt. ii.

*Dexia genuina*, Mexico, WULP, p. 243, Biol. Centr. Am. Dipt. ii, n. sp.

*Dexiosoma vibrissatum*, Mexico, WULP, p. 244, pl. v, fig. 13, Biol. Centr. Am. Dipt. ii, n. sp.

√ *Drepanoglossa*, n. g., *Phytoinae*, p. 377, for *D. lucens*, n. sp., New Mexico, p. 378; TOWNSEND, Tr. Am. Ent. Soc. xviii.

*Echinomyia meigenii*, No. 96, p. 7, *macquartii*, p. 9, *ligustica*, No. 97, p. 1, *cenisia*, p. 2, *camerani*, p. 4, *roederii*, p. 5, *similis*, p. 6, *dispersa*, p. 7, Europe, GIGLIO-TOS, Boll. Mus. Zool. Tor. vi, No. 96, n. spp.

√ *Ennyomma*, n. g., near *Clista*, for *E. clistoides*, n. sp., Illinois; TOWNSEND, Tr. Am. Ent. Soc. xviii.

√ *Epigrimyia*, n. g., *Phytoinae*, p. 375, for *E. polita*, n. sp., Vancouver, p. 376; TOWNSEND, Tr. Am. Ent. Soc. xviii.

*Euantha pulchra*, Mexico, WULP, p. 249, Biol. Centr. Am. Dipt. ii, n. sp.

*Eustalomyia*: monograph of the European species; KOWARZ, pp. 101-106, Wien. ent. Z. x.

*Exorista flavicauda*, Riley, referred to *Frontina*; TOWNSEND, p. 364, Tr. Am. Ent. Soc. xviii.

*E. ciliata*, Illinois, TOWNSEND, p. 363, Tr. Am. Ent. Soc. xviii; *E. chrysophani*, Iowa, *id.* Ent. News, ii, p. 198; *E. lagoæ*, Mexico, *id. t. c.* p. 159 : n. spp.

*Frerea tetropsis*, W. Africa; BIGOT, Ann. Soc. Ent. Fr. 1891, p. 376.

*Frontina acroglossoides*, Illinois, TOWNSEND, p. 367, Tr. Am. Ent. Soc. xviii, n. sp.

*Glossina grossa*, p. 377, *pallicera*, p. 378, W. Africa, BIGOT, Ann. Soc. Ent. Fr. 1891, n. spp.

✓*Goniochata*, n. g., near *Plagia*, p. 351, for *G. plagioides*, n. sp., New Mexico, p. 352; TOWNSEND, Tr. Am. Ent. Soc. xviii.

*Hamatobia alcis*, N. America, SNOW, p. 89, Canad. Ent. xxiii, n. sp.

*Homalomyia vesparia*, England, MEADE, Ent. M. M. (2) ii, pp. 42 & 78, n. sp.

*Homodexia triangulifera*, Big., systematic position and synonymy discussed; WULF, p. 264, Biol. Centr. Am. Dipt. ii.

*Hyadesimyia sarcophagoidea* referred to *Zelleria*; BIGOT, p. cxxxvi, Bull. Soc. Ent. Fr. 1891.

*Hylemyia coarctata*, notes on habits; ORMEROD, Rep. 1890, p. 49. *H. criniventris*, Zett., and *penicillaris*, Rond., synonymy discussed; MIK, p. 60, Wien. ent. Z. x.

*Hyalomyia punctigera*, p. 135, *aldrichii*, *robertsonii*, p. 136, *purpurascens*, p. 137, N. America, TOWNSEND, P. E. Soc. Wash. ii, n. spp.

✓*Hypertrophocera*, n. g. (*Tachininæ*, s. str.), p. 360, for *H. parvipes*, n. sp., New Mexico, p. 361; TOWNSEND, Tr. Am. Ent. Soc. xviii.

*Hystrihodexia*, Röd., characters and composition described, pp. 218 & 219, *Rhamphinia formidialis*, Big., and *Hystrisiphona pseudohystricea*, Br. & Berg., referred to it and figured, pp. 219 & 220, pl. v, figs. 3 & 4; WULF, Biol. Centr. Am. Dipt. ii.

*H. echinata*, p. 220, *contristans*, *coracina*, p. 221, WULF, Biol. Centr. Am. Dipt. ii, n. spp.

✓*Laccoprosopa*, n. g. (*Tachininæ*, s. str.) p. 365, for *L. sarcophagina*, n. sp., Illinois, p. 366, TOWNSEND, Tr. Am. Ent. Soc. xviii.

*Leucostoma atra*, Illinois, TOWNSEND, p. 380, Tr. Am. Ent. Soc. xviii, n. sp.

*Leptoda gracilis*, Wied., figured, pl. vi, fig. 5; WULF, Biol. Centr. Am. Dipt. ii.

*L. semirufa*, Mexico, WULF, p. 250, Biol. Centr. Am. Dipt. ii, n. sp.

*Lucilia sylvarum*, attacking living toads; DUNCKER (219).

*L. fulvicornis*, p. 379, *assiniensis*, p. 380, W. Africa, BIGOT, Ann. Soc. Ent. Fr. 1891, n. spp.

*Macquartia spinicincta*, Britain, MEADE, Ent. M. M. (2) ii, p. 155, n. sp.

*Macrometopa* (sub *Microphthalma*) *calogaster*, Big., = (*mexicana*, Br. & Berg.), the insect figured, pl. v, fig. 14; WULF, p. 245, Biol. Centr. Am. Dipt. ii.

*Masicera pachytyli*, Australia, SKUSE, p. 256, Agric. Gaz. N.S.W.; *M. schizuræ*, Kansas, TOWNSEND, Psyche, vi, p. 187; *M. nigrita*, p. 358, *sordicolor*, p. 359, Illinois, TOWNSEND, Tr. Am. Ent. Soc. xviii: n. spp.

*Masipoda geminata*, Br. & Berg., = (*Ecorista latimana*, Wulp); WULP, p. 211, Biol. Centr. Am. Dipt. ii.

*Megaparia*, n. g., near *Dinera*, for *M. venosa*, n. sp., Mexico, pl. v, fig. 9; WULP, p. 240, Biol. Centr. Am. Dipt. ii.

*Meigenia websteri*, Indiana, TOWNSEND, p. 206, Canad. Ent. xxiii; *Myphanthria*, New Mexico, TOWNSEND, Psyche, vi, p. 176 (see also *Phorocera*, n. sp.): n. spp.

† *Melaleuca*, n. g. (*Dexiine*), p. 247, for *M. spectabilis*, n. sp., Mexico, p. 248, pl. vi, fig. 3; WULP, Biol. Centr. Am. Dipt. ii.

*Melia forcipata*, Big., note on synonymy of; MIK, p. 5, Wien. ent. Z. x.

*Melieria picta*, W. Africa, BIGOT, p. 383, Ann. Soc. Ent. Fr. 1891, n. sp.

† *Microchaetina*, n. g. (*Dexiine*), p. 240, for *M. cinerea*, n. sp., Mexico, pl. v, fig. 10; WULP, p. 241, Biol. Centr. Am. Dipt. ii.

*Microtricha*: characters of noticed; MIK, p. 209, Wien. ent. Z. x.

*Miltogramma flavicornis*, p. 355, *argentifrons*, p. 357, *cinerascens*, p. 358, Illinois; TOWNSEND, Tr. Am. Ent. Soc. xviii, n. spp.

*Morinia trichopoda*, *longitarsis*, *fumata*, Mexico, WULP, p. 261, Biol. Centr. Am. Dipt. ii, n. spp.

*Mydæa affinis*, England, MEADE, Ent. M. M. (2) ii, p. 42, n. sp.

*Myiomintho*, Br. Berg., note on; TOWNSEND, p. 372, Tr. Am. Ent. Soc. xviii.

*Myocera rava*, Mexico, WULP, p. 237, Biol. Centr. Am. Dipt. ii, n. sp.

† *Neotropidomyia*, n. n. for *Tropidomyia*, Br. Berg., nec Willist.; TOWNSEND, p. 382, Tr. Am. Ent. Soc. xviii.

† *Neouromyia*, n. n. for *Uromyia*, Meigen., nec Rob.-Desv.; TOWNSEND, p. 382, Tr. Am. Ent. Soc. xviii.

*Ocyptera arcuata*, Say, referred to *Wahlbergia*; TOWNSEND, P. E. Soc. Wash. ii, p. 143.

*O. argentea*, N. America, TOWNSEND, P. E. Soc. Wash. ii, p. 144, n. sp.

*Pachyophthalmus aurifrons*, Illinois, TOWNSEND, p. 354, Tr. Am. Ent. Soc. xviii, n. sp.

*Pachystylum*: note on its composition; MIK, p. 206, Wien. ent. Z. x.

† *Parabrachymera*, n. g., for *Pachystylum rugosum*, Mik; MIK, p. 212, Wien. ent. Z. x.

*Pegomyia hyoscyami*, habits; DECAUX, p. cliii, Bull. Soc. Ent. Fr. 1891.

*Phania*: notes on the composition of the genus, and characters of the species; RÖDER, Ent. Nachr. xvii, p. 82.

*P. insularis*, Canary Is., BIGOT, p. 278, Bull. Soc. Z. Fr. xvi, n. sp.

*Phasia atripennis*, Say, referred to *Wahlbergia*; TOWNSEND, P. E. Soc. Wash. ii, p. 134.

*Phasiapteryx* (sub *Pyrrhosia*) *ochracea*, Big., = (*bilimeki*, Br. & Berg., = *Neoptera rufa*, Wulp); WULP, p. 210, Biol. Centr. Am. Dipt. ii.

† *Phasioclista*, n. g., near *Clista*, p. 369, for *P. metallica*, n. sp., N. America, p. 370; TOWNSEND, Tr. Am. Ent. Soc. xviii.



*Phorocera edwardsii*, Willist., ♂ described; TOWNSEND, p. 366, Tr. Am. Ent. Soc. xviii.

*P. æneiventris*, Teneriffe, BIGOT, p. 277, Bull. Soc. Z. Fr. xvi; *P. promiscua*, N. America, TOWNSEND, Psyche, vi, p. 84; the species referred to *Meigenia*, t. c. p. 177 : n. spp.

*Prosenia* (sub *Mochlosoma*) *valida*, Br. & Berg., described and figured; WULF, p. 215, pl. v, fig. 2, Biol. Centr. Am. Dipt. ii.

*P. lacertosa*, p. 215, pl. v, fig. 1, *tessellans*, p. 216, *melana*, p. 217, Mexico, WULF, Biol. Centr. Am. Dipt. ii, n. spp.

*Prosopea americana*, Big., and *Prospherysa contigua*, Wulp, are one species; WULF, p. 210, Biol. Centr. Am. Dipt. ii.

*Pseudomorinia*, n. g. (*Dexiinae*), p. 259, for *P. pictipennis*, n. sp., Mexico, p. 260, pl. vi, fig. 14; WULF, Biol. Centr. Am. Dipt. ii.

*Pseudopachystylum*, n. g., for *P. wachtliei* = (*Pach. breinii*, Schin., nec Mcq.), n. sp., Germany; MIK, p. 208, Wien. ent. Z. x.

*Rhamphinia*, Bigot, merged in *Rhynchodexia*; the latter characterised; WULF, p. 225, Biol. Centr. Am. Dipt. ii.

*Rhinia vertebrata*, p. 378, *tricincta*, p. 379, W. Africa, BIGOT, Ann. Soc. Ent. Fr. 1891, n. spp.

*Rhombothyria*, n. g. (*Dexiinae*), for *R. flavicosta*, n. sp., Mexico, pl. vi, fig. 13; WULF, p. 259, Biol. Centr. Am. Dipt. ii.

*Rhynchodexia* (sub *Rhamphinia*) *anthracina*, Big., = (*Prosenia obscura*, Big.); WULF, p. 218, Biol. Centr. Am. Dipt. ii.

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*Scotiptera melaleuca*, Macq., figured, pl. v, fig. 5, Biol. Centr. Am. Dipt. ii.

*S. varipennis*, Mexico, WULF, p. 224, Biol. Centr. Am. Dipt. ii, n. sp.

*Siphona illinoiensis*, Carlinville, TOWNSEND, p. 368, Tr. Am. Ent. Soc. xviii, n. sp.

*Siphoplagia*, n. g., near *Plagia*, p. 349, for *S. anomala*, n. sp., New Mexico, p. 350, TOWNSEND, Tr. Am. Ent. Soc. xviii.

*Spilogaster flaviceps*, p. 380, *leucorhinus*, p. 381, W. Africa, BIGOT, Ann. Soc. Ent. Fr. 1891, n. spp.

*Stenodexia*, n. g., for *S. albicincta*, n. sp., Mexico, pl. v, fig. 15; WULF, p. 246, Biol. Centr. Am. Dipt. ii.

*Stomatodexia cothurnata*, Wied., = (*Prosenia maculifera*, Big.); WULF, p. 218, Biol. Centr. Am. Dipt. ii.

*S. similigena*, Mexico, WULF, p. 239, Biol. Centr. Am. Dipt. ii, n. sp.

*Tachina*: note on oviposition; DYAR, Ins. Life, iii, p. 414.

*T. spinosula*, Illinois, TOWNSEND, p. 353, Tr. Am. Ent. Soc. xviii; *T. clisiocampæ*, N. America, *id.* Psyche, vi, p. 83 : n. spp.

*Thelairoides*, n. g., p. 254, for *T. cinereicollis*, *pallida*, pl. vi, fig. 10, 1891. [VOL. XXVIII.]

n. spp., Mexico, p. 255, and *Homodesia vittigera*, Big. ; WULP, Biol. Centr. Am. Dipt. ii.

*Trichopoda aurantiaca*, N. America, TOWNSEND, P. E. Soc. Wash. ii, p. 140, n. sp.

*Tromodesia hæmorrhoidalis*, Big., redescribed and figured ; WULP, p. 238, pl. v, fig. 8, Biol. Centr. Am. Dipt. ii.

*Ugimya sericariæ* : translation of MIK's 1890 paper on this in *Ins. Life*, iv, pp. 113-119.

*Uramya producta*, Rob.-Desv., redescribed, p. 251, figured, pl. vi, fig. 6 ; WULP, Biol. Centr. Am. Dipt. ii.

*Uromyia* : synonymical note ; BRAUER, p. 37, SB. Verh. z.-b. Wien, xli.

*Vanderwulpia*, n. g., near *Atrophopoda*, for *V. atrophopoides*, n. sp., New Mexico, TOWNSEND, Tr. Am. Ent. Soc. xviii, p. 381.

*Wahlbergia atripennis*, N. America, TOWNSEND, p. 145, P. E. Soc. Wash. ii, n. sp.

*Xanthodesia*, n. g., for *Tachina sericea*, Wied., which is figured, pl. vi, fig. 11 ; WULP, p. 256, Biol. Centr. Am. Dipt. ii.

*Xysta obtusa*, W. Africa, BIGOT, p. 377, Ann. Soc. Ent. Fr. 1891, n. sp.

*Zygobothria*, n. g., for *Sturmia atropivora*, Rob. ; MIK, p. 193, Wien. ent. Z. x.

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*Edaspis diaphasis*, W. Africa, BIGOT, p. 384, Ann. Soc. Ent. Fr. 1891, n. sp.

*Agromyza vagans*, Fall., synonymical note ; MIK, pp. 189-191, Wien. ent. Z. x.

*Carpomyia pardalina*, Beluchistan, BIGOT, p. 51, Ind. Mus. Notes, ii, n. sp.

*Cleigastra* : revised list of the N. American species ; TOWNSEND, p. 155, Canad. Ent. xxiii.

*C. suisterci*, N. America, TOWNSEND, Canad. Ent. xxiii, p. 153, n. sp.

*Ceratitis capitata*, metamorphoses figured ; RILEY, p. 255, pl. iii, figs. 1 & 2, Rep. 1890.

*Ceratitis ? penicillatus*, W. Africa, BIGOT, p. 381, Ann. Soc. Ent. Fr. 1891, n. sp.

*Chlorops teniopus*, notes on ; ORMEROD, Rep. 1890, p. 28.

*Chlorops bilineatus*, Canary Is., BIGOT, p. 279, Bull. Soc. Z. Fr. xvi, n. sp.

*Cordylura* : revised list of the N. American species ; TOWNSEND, p. 155, Canad. Ent. xxiii.

*Drosophila nitidapex*, Canary Is., BIGOT, p. 279, Bull. Soc. Z. Fr. xvi, n. sp.

*Herina rufocromata*, W. Africa, BIGOT, p. 381, Ann. Soc. Ent. Fr. 1891, n. sp.

*Ilythea nigricauda*, Canary Is., BIGOT, p. 278, Bull. Soc. Z. Fr. xvi, n. sp.

*Megaglossa catogastera*, W. Africa, BIGOT, p. 384, Ann. Soc. Ent. Fr. 1891, n. sp.

*Nemopoda cothurnata*, W. Africa, BIGOT, p. 385, Ann. Soc. Ent. Fr. 1891, n. sp.

*Orellia schineri* and *vesuviana*, distinctive characters; RÖDER, Ent. Nachr. xvii, pp. 209 & 210.

*Palloptera* (?) *pantherina*, W. Africa, BIGOT, p. 382, Ann. Soc. Ent. Fr. 1891, n. sp.

*Psilopa rüderi*, Geneva, TOURNIER, p. 244, L'Ent. Genev. i, n. sp.

*Rhinotora leucopsis*, W. Africa, BIGOT, p. 386, Ann. Soc. Ent. Fr. 1891, n. sp.

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*Toxotrypana*, note on systematic position of; MIK, p. 4, Wien. ent. Z. x: the position is certainly in *Ortalidæ*, ♀ of *furcifera*? described; RÖDER, Wien. ent. Z. x, pp. 31 & 32.

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*Cyclopodia rubiginosa*, W. Africa, BIGOT, p. 386, Ann. Soc. Ent. Fr. 1891, n. sp.

✓*Trichobius*, n. g., near *Strebla*, for *T. dugesii*, n. sp., Mexico; TOWNSEND, Ent. News, ii, p. 106.

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*Anaxilaus*, Stål, = (*Novatilla*, Dist.); BERGROTH, p. 206, Rev. d'Ent. x.

*A. barnardi*, Queensland, BERGROTH, p. 205, Rev. d'Ent. x, n. sp.

*Antestia cincticollis*, Schaum, var. described; BERGROTH, p. 208, Rev. d'Ent. x.

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*Brachymenum*, Mayr, should be used instead of *Eurys*, Dall; BERGROTH, p. 214, Rev. d'Ent. x.

*Callidea rama*, Ceylon, KIRBY, p. 76, pl. iv, fig. 3, J. L. S. xxiv, n. sp.

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✓ *Chelycoris*, n. n. for *Demoleus*, Stål; BERGROTH, p. 235, Rev. d'Ent. x.

✓ *Chelyschema*, n. n. for *Achates*, Stål; BERGROTH, p. 235, Rev. d'Ent. x.

✓ *Chelysoma*, n. n. for *Orsilochus*, Stål; BERGROTH, p. 235, Rev. d'Ent. x.

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✓ *Cronion*, n. n. for *Póseidon*, Voll.; BERGROTH, p. 214, Rev. d'Ent. x.

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✓ *Dallasia*, n. n. for *Stenocoris*, Sign.; BERGROTH, p. 235, Rev. d'Ent. x.

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*Dalsira bigemmis*, Sumatra, BERGROTH, p. 212, Rev. d'Ent. x, n. sp.

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✓ *Diaphyta*, n. n. for *Peribæa*, Stål; BERGROTH, p. 214, Rev. d'Ent. x.

*Diolcus pusillus*, Uruguay, BERG, p. 168, An. Soc. Arg. xxxii, n. sp.

*Durmia obtusa*, Senegal, SIGNORET, p. 468, Ann. Soc. Ent. Fr. 1891, n. sp.

*Eurydema festivum*, n. var. *chloroticum*; HORVATH, p. 78, Rev. d'Ent. x.

*Euschistus bovilla*, Dist., referred to *Mormidea* and redescribed; BERGROTH, p. 222, Rev. d'Ent. x. *E. cornutus*, Dall., ♂ characters; *id.* p. 223, t. c.

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✓ *Ectmetocaru*, n. n. for *Candace*, Stål; BERGROTH, p. 214, Rev. d'Ent. x.

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✓ *Glyphepomis*, n. g., near *Dichelops*, p. 280, for *G. adroguensis*, n. sp., Buenos Ayres, p. 281; BERG, An. Soc. Arg. xxxii.

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✓ *Hippota*, n. n. for *Plexippus*, Stål; BERGROTH, p. 214, Rev. d'Ent. x.

✓ *Hypatropis*, n. n. for *Melpia*, Stål; BERGROTH, p. 235, Rev. d'Ent. x.

† *Lobepomis*, n. g. (*Halydina*), p. 236, for *L. peltifera*, n. sp., Uruguay, p. 237; BERG, An. Soc. Arg. xxxii.

✓ *Lobolophus*, n. n. for *Lobonotus*, Uhler; BERGROTH, p. 235, Rev. d'Ent. x.

*Lobostoma*, A. & S., should be called *Prolobes*, A. & S.; BERGROTH, p. 235, Rev. d'Ent. x.

*Lobothyreus ansatus*, Dist., referred to *Crathis*, Stål; BERGROTH, p. 215, Rev. d'Ent. x.

*L. illex*, Brazil, BERGROTH, p. 214, Rev. d'Ent. x, n. sp.

† *Marmessulus*, n. n. for *Marmessus*, Stål; BERGROTH, p. 235, Rev. d'Ent. x.

✓ *Megarrhamphus*, n. n. for *Megarrhynchus*, Lap.; BERGROTH, p. 214, Rev. d'Ent. x.

*Menida gerstaeckeri*, Sierra Leone, BERGROTH, p. 209, Rev. d'Ent. x, n. sp.

✓ *Microrrhampus*, n. n. for *Microrrhynchus*, Sign.; BERGROTH, p. 214, Rev. d'Ent. x.

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*Natalicola*, Spin., should be used in place of *Cyclogaster*, Westw.; BERGROTH, p. 214, Rev. d'Ent. x.

✓ *Neagenor*, n. n. for *Agenor*, Dall.; BERGROTH, p. 214, Rev. d'Ent. x.

† *Neococalus*, n. n. for *Cocalus*, Stål; BERGROTH, p. 214, Rev. d'Ent. x.

† *Neodius*, n. n. for *Odius*, Stål; BERGROTH, p. 214, Rev. d'Ent. x.

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✓ *Ochetostethus brachyscytus*, Suez, REUTER, p. 138, Rev. d'Ent. x, n. sp.

*Odontotarsus lautus*, Armenia, HORVATH, p. 75, Rev. d'Ent. x, n. sp.

*Oebalus pugnax*, habits; GARMAN, Psyche, vi, p. 61.

✓ *Oenopiella*, n. n. for *Oenopia*, Stål; BERGROTH, p. 235, Rev. d'Ent. x.

*Oncocoris insulanus*, New Britain, BERGROTH, p. 202, Rev. d'Ent. x, n. sp.

✓ *Oscula*, n. n. for *Osca*, Stål, BERGROTH, p. 214, Rev. d'Ent. x.

*Padæus pseudoscyllax*, Brazil, BERGROTH, p. 225, Rev. d'Ent. x, n. sp.

✓ *Paracritheus*, n. n. for *Astyanax*, Stål; BERGROTH, p. 214, Rev. d'Ent. x.

✓ *Parantheca*, n. g., near *Oenopia*, for *P. subfurcata*, Cordoba, p. 283, *aliomorpha*, Paraguay, p. 285, n. spp., BERG, An. Soc. Arg. xxxii.

*Pentatoma* ? *corinna*, Ceylon, KIRBY, p. 84, pl. iv, fig. 12, J. L. S. xxiv, n. sp.

*Picromerus bidens*, habits; SANDAHL, p. 232, Ent. Tidskr. xii.

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*Podisus signoreti*, Brazil, *nebulosus*, Venezuela, FALLOU, p. 6, Rev. d'Ent. x; *P. connexivus*, p. 215, *curvispina*, p. 216, *mellipes*, *vilis*, p. 217, Brazil, *argilliventris*, Ecuador, p. 218, *dufouri*, p. 219, *distans*, p. 220, Brazil, BERGROTH, Rev. d'Ent. x : n. spp.

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*Rhaphigaster repellens*, pl. iv, fig. 9, *sordida*, Ceylon, KIRBY, p. 86, J. L. S. xxiv, n. spp.

*Rhæcus*, n. n. for *Oncoscelis*, Westw.; BERGROTH, p. 214, Rev. d'Ent. x.

*Rhynchocoris taprobanensis*, Ceylon, BERGROTH, p. 211, Rev. d'Ent. x, n. sp.

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*Thyreocoris maculosus*, Mission Territory, BERG, p. 170, An. Soc. Arg. xxxii, n. sp.

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*Corizus languidus*, Armenia, HORVATH, p. 78, Rev. d'Ent. x, n. sp.

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*Tupalus annulatus*, Senegal, SIGNORET, p. 469, Ann. Soc. Ent. Fr. 1891, n. sp.

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*Hydrobatidæ*: species with raptorial prehensile antennæ described and figured; RILEY & HOWARD, Ins. Life, iv, p. 198, fig. 22.

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*Ectrychotes nigripes*, Bengal, LETHIERRY, p. cxliv, C.R. Ent. Belg. xxxv, n. sp.

*Eumerus decoratus*, Senegal, SIGNORET, p. 470, Ann. Soc. Ent. Fr. 1891, n. sp.

†*Formicoris*, n. g., for *F. inflatus*, n. sp., Ceylon, pl. iv, fig. 17; KIRBY, p. 122, J. L. S. xxiv.

*Harpactor monticola*, n. var. *jucundus*; HORVATH, p. 80, Rev. d'Ent. x.

*H. rufigena*, Gaboon, FALLOU, p. 9, Rev. d'Ent. x: *H. bicoloratus*, *obscurus*, Ceylon, KIRBY, p. 120, J. L. S. xxiv: n. spp.

*Harpiscus rufus*, *violaceus*, Sierra Leone, FALLOU, p. 9, Rev. d'Ent. x, n. spp.

*Opsicæus fuscus*, Senegal, SIGNORET, p. 471, Ann. Soc. Ent. Fr. 1891, n. sp.

*Pirates nigrigenu*, Sierra Leone, FALLOU, p. 9, Rev. d'Ent. x; *P. stigmativentris*, p. 112, *ypsilon*, pl. iv, fig. 8, p. 113, Ceylon, KIRBY, J. L. S. xxiv: n. spp.

*Pnohirminus whymperei*, n. sp., figured; DISTANT, p. 117, in Whympers Supp. App.

*Lestomerus horridus*, Ceylon, KIRBY, p. 111, pl. iv, fig. 16, J. L. S. xxiv; *L. tuberculatus*, Panama, *varipes*, Venezuela, *trimaculatus*, Borneo, FALLOU, p. 10, Rev. d'Ent. x: n. spp.

*Scadra cincticornis*, Ceylon, KIRBY, p. 119, J. L. S. xxiv, n. sp.

*Stenopoda scutellata*, n. sp., figured; DISTANT, p. 116, in Whympers Supp. App.

*Sycanus* (?) *militaris*, Ceylon, KIRBY, p. 119, J. L. S. xxiv, n. sp.

### SALDIDÆ (ACANTHIIDÆ), CIMICIDÆ.

*Acanthia xanthocheila*, n. var. *limbosa*; HORVATH, p. 80, Rev. d'Ent. x. *A. andensis*, n. sp., figured; DISTANT, p. 118, in Whympers Supp. App.

*A. branczikii*, Hungary, p. 21, *jakowleffi*, Turkestan, p. 22, *henschii*, Hungary, *mutabilis*, France, p. 23, *amplicolis*, Greece, p. 25, *A. (Charto-scirta) dilutipennis*, Turkestan, REUTER, p. 26, Rev. d'Ent. x, n. spp.

*Cimex lectularius*, original country; KIRBY, p. 111, J. L. S. xxiv. *C. atomarius*, Germ., referred to *Carbula*; BERGROTH, p. 204, Rev. d'Ent. x.

*Ectemnus parilis*, Armenia, HORVATH, p. 80, Rev. d'Ent. x, n. sp.

*Leptopus bertkaui*, Bonn, VERHOEFF, p. 197, B. E. Z. xxxvi; *L. strigipes*, Madagascar, BERGROTH, p. cli, Bull. Soc. Ent. Fr. 1891: n. spp.

*Salda*: varieties described, with *S. versabilis*, apparently a combination of forms previously described under other names; VERHOEFF, Ent. Nachr. xvii, pp. 337-345. *S. lateralis*, notes on synonymy and variation, p. 198, *pilosa*, n. var. *hirsuta*, p. 201; *id.* B. E. Z. xxxvi.

*S. maritima*, I. of Norderney, VERHOEFF, p. 202, B. E. Z. xxxvi, n. sp.

†*Velocipeda*, n. g.; type of a new subfamily of *Saldidæ*, to be called *Velocipedinæ*, p. 263, for *V. prisca*, n. sp., Java, p. 265; BERGROTH, Wien. ent. Z. x.

## CAPSIDÆ.

The new species contained in the paper in Tr. Maryland Ac. Sci. mentioned in Zool. Rec. 1890, p. 296, *Ins.*, are now recorded below.

*Atractotomus coxalis*, Java, REUTER, p. 137, Rev. d'Ent. x, n. sp.

*Camptobrochis scutellaris*, Java, REUTER, p. 133, Rev. d'Ent. x, n. sp.

*Capsus capillaris*, F., habits; VERHOEFF, Ent. Nachr. xvii, p. 26. *C. bicolor*, M. & R., referred to *Stheuirus*; REUTER, p. 51, Wien. ent. Z. x.

*C. ravana*, pl. iv, fig. 10, *rama*, p. 106, *antennatus*, *lankanus*, p. 107, Ceylon, KIRBY, J. L. S. xxiv : n. spp.

† *Cloptercoris*, n. g. (*Cyllecoraria*), p. 76, for *C. ornata*, n. sp., California, p. 77; UHLER, Tr. Maryland Ac. Sci. 1890.

† *Coquillettia*, n. g. (*Cyllecoraria*, near *Orectoderus*), p. 78, for *C. insignis*, n. sp., California, p. 79; UHLER, Tr. Maryland Ac. Sci. 1890.

*Cylapus tenuicornis*, figured and noticed; HEIDEMANN, P. E. Soc. Wash. ii, p. 68. *C. tenuicornis*, Say, = (*Valdasus famularis*, Stål); UHLER, P. E. Soc. Wash. ii, p. 123.

† *Dionyza variegata* (n. g. & sp.), figured; DISTANT, p. 113, in Whympers Supp. App.

† *Ectoplocerus*, n. g. (*Cyllecoraria*), p. 73, for *E. anthracinus*, n. sp., California, p. 74; UHLER, Tr. Maryland Ac. Sci. 1890.

*Halticus tibialis*, Java, REUTER, p. 135, Rev. d'Ent. x, n. sp.

† *Heidemannia*, n. g., p. 119, for *H. cixiiformis*, n. sp., N. America, p. 121, woodcut; UHLER, P. E. Soc. Wash. ii.

† *Hypselacus*, n. g., for *Sthenarus visci*, Put., forming a new division, *Hypselacaria*; REUTER, p. 49, Wien. ent. Z. x.

† *Lamprocranium*, n. g., *Pilophoraria*, p. 134, for *L. unguiculare*, n. sp., Java, p. 135; REUTER, Rev. d'Ent. x.

† *Lasiomiris*, n. g., *Miriaria*, for *L. lineaticollis*, n. sp., Java; REUTER, p. 130, Rev. d'Ent. x.

*Leptomercoris punctatus*, Ceylon, KIRBY, p. 108, J. L. S. xxiv, n. sp.

† *Lyde translucida* (n. g. & sp.), figured; DISTANT, p. 113, in Whympers Supp. App.

*Lygus suturalis*, Java, REUTER, p. 133, Rev. d'Ent. x, n. sp.

*Macrotylus regalis*, p. 86, *tristis*, p. 87, *vestitus*, p. 88, California, UHLER, Tr. Maryland Ac. Sci. 1890, n. spp.

† *Mecistoscelis*, n. g., *Miraria*, p. 131, for *M. scirtetoides*, n. sp., Java, p. 132; REUTER, Rev. d'Ent. x.

*Megacelum annulicorne*, Java, REUTER, p. 132, Rev. d'Ent. x, n. sp.

† *Mimoceps*, n. g., *Myrmecoraria*, p. 83, for *M. insignis*, Chicago, p. 84, *gracilis*, Wisconsin, p. 85, n. spp.; UHLER, Tr. Maryland Ac. Sci. 1890.

† *Neomiris præcelsus* (n. g. & sp.), figured; DISTANT, p. 113, in Whympers Supp. App.

† *Peritropis*, n. g., p. 121, for *P. saldeformis*, n. sp., N. America, p. 122; UHLER, P. E. Soc. Wash. ii.

*Phytocoris niveatus*, Armenia, HORVATH, p. 80, Rev. d'Ent. x, n. sp.

<sup>v</sup>*Rhinocapsus*, n. g., near *Phylus*, p. 81, for *R. vanduzii*, n. sp., New York, p. 82; UHLER, Tr. Maryland Ac. Sci. 1890.

<sup>v</sup>*Teleorhinus*, n. g. (*Cyllecoraria*, near *Orectoderus*), p. 74, for *T. cyaneus*, n. sp., California, p. 75; UHLER, Tr. Maryland Ac. Sci. 1890.

*Xenetus regalis*, p. 80, *scutellatus*, p. 81, N. America, UHLER, Tr. Maryland Ac. Sci. 1890, n. spp.

### HYDROCORISÆ.

*Belostomatidæ* and *Nepidæ*: systematic relations discussed; SCHMIDT, SB. nat. Fr. 1891, pp. 49-54.

*Naucoris* ? *punctatissima*, Ceylon, KIRBY, p. 125, J. L. S. xxiv, n. sp.

*Notonecta simplex*, p. 125, *templetonii*, *abbreviata*, p. 126, Ceylon, KIRBY, J. L. S. xxiv, n. spp.

*Ochterus*, not *Octhera*, is to be used in place of *Pelagonus*; BERGROTH, Bull. Soc. Ent. Fr. 1890, p. cxix.

## HEMIPTERA-HOMOPTERA.

[Cf. BUCKTON (110), DISTANT (186, 187, 188, 963), DUZEE (223), EDWARDS (233), HORVATH (414), HUDSON (423), KARSCH (447, 448), KIRBY (468), LETHBRIDGE (525), OSBORN (639), REY (714), UHLER (886); also *Aphididæ* and *Coccidæ*.]

Notes on the structure of the pygofer of the *Tettigidæ*; BUCKTON, Mon. Brit. Cicadæ, ii, pp. 156-163.

The new species mentioned in Zool. Rec. 1890, p. 300, *Ins.*, as described by UHLER, in Tr. Maryland Ac. Sci., are now recorded below.

### CICADIDÆ.

*Carineta fimbriata* (Wlk., MS.), figured; DISTANT, p. 119, in Whympers Supp. App.

*Cicada*: characters of the New Zealand species, *C. cingulata*, figured with details, pl. ix: HUDSON, Tr. N. Z. Inst. xxiii. *C. septemdecim*, note on the old broods; MOTTE, Ins. Life, iv, p. 141.

*C. apicalis*, Ceylon, KIRBY, p. 131, pl. v, fig. 1, J. L. S. xxiv; *C. tristis*, p. 52, *aprilina*, *iolanthe*, p. 53, *cassiope*, p. 54, New Zealand, HUDSON, Tr. N. Z. Inst. xxiii: n. spp.

*Cosmopsaltria*: descriptions of species continued with numerous figures, pp. 49-68; DISTANT, Mon. Or. Cicad.

*Cryptotympana mandarina*, China, p. 86, pl. xi, fig. 7, *demissitia*, Sumatra, p. 89, pl. xiii, fig. 11, *exalbida*, Neelgiri Hills, p. 92, pl. xiii, fig. 12, DISTANT, Mon. Or. Cicad., n. spp.

*Dundubia mixta*, Ceylon, KIRBY, p. 128, J. L. S. xxiv, n. sp.

*Fidicina oleacea*, Mexico, DISTANT, p. 294, Ann. N. H. (6) viii, n. sp.

<sup>1</sup>*Nablistes*, n. g. (*Tibiceninae*), p. 350, for *N. terebrata*, n. sp., Cameroons, p. 351; KARSCH, Ent. Nachr. xvii.

*Oxypleura basalis*, Senegal, SIGNORET, p. 471, Ann. Soc. Ent. Fr. 1891, n. sp.

*Perissoneura*: this name is preoccupied in *Trichoptera*; MACLACHLAN, p. 319, Ent. Nachr. xvii.

*Pomponia greeni*, pl. v, fig. 11, p. 129, *elegans*, p. 130, Ceylon, KIRBY, J. L. S. xxiv; *P. pumila*, Borneo, p. 73, pl. xiii, figs. 8a, b, *translucida*, Sulu Is., p. 76, pl. xiii, fig. 7, *dohertyi*, Upper Assam, p. 77, pl. xiii, fig. 9, DISTANT, Mon. Or. Cicad.: n. spp.

*Tibicen cupreosparsa*, California, UHLER, Tr. Maryland Ac. Sci. 1888, p. 43, n. sp.

<sup>1</sup>*Trismarcha*, n. g., *Tibiceninae*, p. 348, for *T. umbrosa*, p. 349, *sericosa*, *ferruginosa*, p. 350, n. spp., Cameroons; KARSCH, Ent. Nachr. xvii.

*Tympanoterpes ruatana*, Yucatan, DISTANT, p. 294, Ann. N. H. (6) viii, n. sp.

### FULGORIDÆ.

*Asiraca clavicornis*, n. var. *divisa*; REY, p. 243, Rev. d'Ent. x.

*Brixia tortriciformis*, Ceylon, KIRBY, p. 138, pl. v, fig. 12, J. L. S. xxiv, n. sp.

<sup>1</sup>*Brixioides*, n. g., p. 139, for *B. carinatus*, n. sp., Ceylon, p. 140, pl. v, fig. 9; KIRBY, J. L. S. xxiv.

*Cixius nubilus*, Wlk., redescribed and figured; KIRBY, p. 137, pl. v, fig. 13, J. L. S. xxiv.

*C. sticticus*, Hyères, REY, p. 240, Rev. d'Ent. x, n. sp.

<sup>1</sup>*Danapteryx*, n. g. *Issidæ*, for *D. manca*, n. sp., California; UHLER, p. 42, Tr. Maryland Ac. Sci. 1888.

*Delphax pellucida*, n. var. *fuscicollis*; REY, p. 244, Rev. d'Ent. x.

*D. ernesti*, pl. v, fig. 14, p. 140, *simplex*, p. 141, Ceylon, KIRBY, J. L. S. xxiv, n. spp.

*Derbe* (?) *nitagalensis*, Ceylon, KIRBY, p. 142, pl. v, fig. 3, J. L. S. xxiv, n. sp.

<sup>1</sup>*Dictyobia*, n. g. *Issidæ*, for *D. permutata*, n. sp., California; UHLER, p. 39, Tr. Maryland Ac. Sci. 1888.

<sup>1</sup>*Dictyonia*, n. g. *Issidæ*, p. 40, for *D. obscura*, n. sp., California, p. 41; UHLER, Tr. Maryland Ac. Sci. 1888.

*Dictyophora percarinata*, p. 134, *viridistigma*, *D.* (?) *egregia*, pl. v, fig. 4, p. 135, Ceylon, KIRBY, J. L. S. xxiv, n. spp.

<sup>1</sup>*Dyctidea*, n. g. *Issidæ*, for *D. angustata*, p. 37, *intermedia*, p. 38, n. spp., California; UHLER, Tr. Maryland Ac. Sci. 1888.

*Elasmoscelis platypoda*, p. 148, pl. vi, fig. 3, *E.* (?) *radians*, fig. 2, p. 149, Ceylon, KIRBY, J. L. S. xxiv, n. spp.

*Eurybrachys westwoodii*, KIRBY, p. 146, pl. vi, fig. 1, J. L. S. xxiv, n. sp.

*Euryrsa pyrenæa*, n. var. *dimidiata*; REY, p. 243, Rev. d'Ent. x.

*Fulgora karenia*, Burma, pl. xx, fig. 2, *pythica*, hab. ♀, fig. 3, p. 517, *effusa*, Borneo, p. 518, fig. 4, *bullata*, Burma, p. 519, fig. 1, DISTANT, Tr. E. Soc. 1891, n. spp.

*Hemisphærius herbaceus*, Ceylon, KIRBY, p. 147, J. L. S. xxiv, n. sp.

*Hotinus insularis*, Ceylon, KIRBY, p. 130, pl. vi, fig. 4, J. L. S. xxiv, n. sp.

*Hysteropterum subangulare*, Cette, p. 241, *chlorizans*, Algeria, p. 242, REY, Rev. d'Ent. x, n. spp.

*Lamenia californica*, Los Angeles, DUZEE, p. 169, Canad. Ent. xxiii, n. sp.

✓*Microchoria*, n. g., p. 147, for *M. aberrans*, n. sp., p. 148, pl. v, fig. 10, KIRBY, J. L. S. xxiv.

*Nogodina greeni*, Ceylon, KIRBY, p. 158, pl. v, fig. 15, J. L. S. xxiv, n. sp.

*Phalænomorpha inconspicua*, p. 150, *parva*, *P. (?) abdominalis*, pl. v, fig. 16, p. 151, Ceylon, KIRBY, J. L. S. xxiv, n. spp.

*Phenice punctativentris*, Ceylon, KIRBY, p. 144, pl. v, fig. 6, J. L. S. xxiv, n. sp.

*Phromnia marginella*, notes on, and figures ; COTES, Ind. Mus. Notes, ii, pp. 95-97, pl. xvi, fig. 2.

*Phronima deltotensis*, Ceylon, KIRBY, p. 155, J. L. S. xxiv, n. sp.

*Phylliphanta albopunctata*, pl. vi, fig. 5, *acutipennis*, fig. 6, p. 156, *dubia*, p. 157, Ceylon, KIRBY, J. L. S. xxiv, n. spp.

*Pæcilopectera glauca*, pl. vi, fig. 14, *quadrata*, fig. 8, KIRBY, p. 154, J. L. S. xxiv, n. spp.

*Polydictya preussi*, W. Africa, KARSCH, p. 1, Ent. Nachr. xvii, n. sp.

*Ricania angulatus*, p. 152, *striatus*, p. 153, Ceylon, KIRBY, J. L. S. xxiv, n. spp.

*Scarpanta latipennis*, Ceylon, KIRBY, p. 153, pl. vi, fig. 9, J. L. S. xxiv, n. sp.

*Seliza bisecta*, pl. v, fig. 5, *nigropunctata*, Ceylon, KIRBY, p. 152, J. L. S. xxiv, n. spp.

*Stacota rufitarsis*, Ceylon, KIRBY, p. 134, J. L. S. xxiv, n. sp.

✓*Symplana*, n. g., near *Dictyophora*, for *S. viridinervis*, n. sp., Ceylon, pl. vi, fig. 11 ; KIRBY, p. 136, J. L. S. xxiv.

*Tettigometra virescens*, n. var. *notaticollis* ; REY, p. 244, Rev. d'Ent. x.

*T. pantherina*, Armenia, HORVATH, p. 81, Rev. d'Ent. x, n. sp.

*Thracia ceylonica*, *lankana*, p. 143, *T. (?) obsoleta*, pl. v, fig. 7, p. 144, Ceylon, KIRBY, J. L. S. xxiv : n. spp.

#### CERCOPIDÆ.

*Aphrophora facialis*, Ceylon, KIRBY, p. 161, J. L. S. xxiv, n. sp.

*Cloviea perductalis*, pl. v, fig. 2, p. 161, *humeralis*, *perstrigata*, p. 162, *bipunctatus*, p. 163, Ceylon, KIRBY, J. L. S. xxiv, n. spp.

*Philænus hirsutus*, Ceylon, KIRBY, p. 160, J. L. S. xxiv, n. sp.

† *Rhinastria*, n. g., near *Cosmoscarta*, p. 159, for *R. bicolor*, n. sp., Ceylon, p. 160, pl. vi, fig. 12; KIRBY, J. L. S. xxiv.

## MEMBRACIDÆ.

*Centrotus atricoxis*, p. 164, *decipiens*, *flavipes*, p. 165, *rectangulatus*, *granulatus*, *bioculatus*, p. 166, *bubalus*, *imitator*, p. 167, *cupreus*, p. 168, Ceylon, KIRBY, J. L. S. xxiv, n. spp.

## JASSIDÆ.

*Acocephalus trifasciatus*, n. var. *lævus*; REY, p. 245, Rev. d'Ent. x.

*Athysanus obscurellus*, n. var. *maculosus*, p. 248, *plebeius*, n. var. *tesselatus*; REY, Rev. d'Ent. x.

*A. atrifrons*, Valais, p. 248, *quadrillum*, Lyons, p. 249, REY, Rev. d'Ent. x; *A. parallelus*, Ontario, DUZEE, p. 169, Canad. Ent. xxiii: n. spp.

*Cicadula*: descriptions of the British species; EDWARDS, Ent. M. M. (2) ii, pp. 29-34. *C. punctifrons*, n. var. *americana*; DUZEE, p. 169, Canad. Ent. xxiii.

*C. fieberi*, England, EDWARDS, p. 32, Ent. M. M. (2) ii; *C. (?) perplexa*, Le Valais, REY, p. 245, Rev. d'Ent. x: n. spp.

*Dellocephalus stigma*, p. 250, *pulchellus*, p. 251, France, REY, Rev. d'Ent. x, n. spp.

*Dicraneura armata*, England, BUCKTON, Mon. Brit. Cicadæ, ii, p. 107, pl. lxiii, fig. 3; *D. (Notus) festiva*, Collioure, REY, p. 253, Rev. d'Ent. x: n. spp.

*Eupteryx putoni*, n. var. *10-notata*; REY, p. 253, Rev. d'Ent. x.

*Goniagnathus palmeri*, N. America, DUZEE, p. 171, Canad. Ent. xxiii, n. sp.

*Gypona striata*, Ceylon, KIRBY, p. 171, J. L. S. xxiv, n. sp.

*Pediopsis nassata*, n. var. *notatifrons*; REY, p. 244, Rev. d'Ent. x.

† *Scaphoideus*, n. g. (*Jassidæ*), p. 33, for *S. intricatus*, *jucundus*, p. 34, *consors*, p. 36, n. spp., N. America, and including *Jussus immistus*, Say; UHLER, Tr. Maryland Ac. Sci. 1888.

† *Splonia*, n. g., near *Propetes*, p. 467, for *S. acutalis*, n. sp., Senegal, p. 468; SIGNORET, Ann. Soc. Ent. Fr. 1891.

*Tettigonia duplicaria*, n. sp., figured; DISTANT, p. 120, in Whympers Supp. App.

*T. pupula*, pl. vi, fig. 10, *frontalis*, p. 169, *pulchella*, fig. 13, p. 170, Ceylon, KIRBY, J. L. S. xxiv, n. spp.

*Thamnotettix sexguttatus*, Lyons, REY, p. 246, Rev. d'Ent. x, n. sp.

*Zygina blandula* n. var. *suavis*, *punctulum* n. var. *crucioris*, *bisignata* n. var. *sanguinosa*, *costalis*, Ferr., characters of; REY, p. 255, Rev. d'Ent. x.

*Z. fasciatocollis*, Lyons, REY, p. 254, Rev. d'Ent. x, n. sp.

## PSYLLIDÆ.

*Diaphorina guttulata*, Bombay, LETHIERRY, p. 165, P. A. S. B. 1890, n. sp.

*Psylla*: abstract of Loew's remarks on the species inhabiting pear trees; RILEY, Ins. Life, iv, p. 127. *P. mali*, notes on; ORMEROD, Rep. 1890, pp. 4-15.

*P. isitis*, Calcutta, BUCKTON, p. 18, Ind. Mus. Notes, ii, n. sp.

## APHIDIDÆ.

[Cf. BÜSGEN (114, 115), BUCKTON (111), COTES (162), DREYFUS (209), FORBES (288), HORVATH (410), TSCHIRCH (877), WEED (944, 945), WELTNER (957), WESTWOOD (958).]

Nature and source of honeydew; BÜSGEN (114, 115).

Casting of skin of rostrum of *Phylloxera*; DREYFUS, Zool. Anz. xiv, p. 61.

*Aphis brassicae*, L., various forms described and figured; WEED, Ins. Life, iii, pp. 289, 290, fig. 24. *A. platanoides*, description of the cocoons formed on it by *Aphidius*; WELTNER, B. E. Z. xxxvi, p. 52. *A. maidis*, figured, pl. A; FORBES, Rep. xvii: life-history; WEED, Bull. Illin. Lab. N. H. iii, pp. 207-214.

✓ *A. maidi-radialis*, N. America, FORBES, Rep. xvii, pp. 64-73, pl. B, n. sp. *Asteopteryx*, n. g., p. 51, for *A. styracophila*, n. sp., Java, KARSCH, p. 52, pl. iv, figs. 16-18, Ber. deutsche Botan. Ges. viii.

✓ *Ceylonia*, n. g., for *C. theæcola*, n. sp., Ceylon; BUCKTON, Ind. Mus. Notes, ii, p. 33.

*Chaitophorus negundinis*, various forms described and figured; WEED, pp. 287 & 288, fig. 23, Ins. Life, iii.

*Lachnus platanicola*, various forms described, pp. 286 & 287, figured, pl. i; WEED, Ins. Life, iii.

*L. fuliginosus*, Quetta, BUCKTON, p. 41, Ind. Mus. Notes, ii, n. sp.

*Melanoxanthus bicolor*, forms of described and figured; WEED, pp. 290 & 291, fig. 25, Ins. Life, iii.

*M. flocculosus*, N. America, WEED, p. 291, fig. 26, Ins. Life, iii, n. sp.

*Pemphigus bursarius*, emigration to *Ranunculus*; BUCKTON, Ent. M. M. (2) ii, p. 269.

*Siphonophora avenæ*, figured; FORBES, pl. C, Rep. xvii. *S. artocarpæ*, additional character; WESTWOOD, p. 413, Tr. E. Soc. 1891.

*Schizoneura lanigera*, notes on; ORMEROD, Rep. 1890, p. 1.

## COCCIDÆ, ALEURODIDÆ.

[Cf. ASHMEAD (21), COQUILLET (160), COTES (164), DOUGLAS (207, 208), FRANCESCHINI (301), KIRBY (468), KÜNCKEL & SALIBA (502, 503), MASKELL (566, 567, 568), NEWSTEAD (617, 619), OLLIFF (635), SHIPLEY (811), WASSILIEFF (935).]

- Generic synopsis ; ASHMEAD, Tr. Am. Ent. Soc. xviii, pp. 92-102.  
 List of species having apterous males ; MASKELL, Tr. N. Z. Inst. xxiii, pp. 8 & 9.  
*Aleurodes filicium*, Göldi, in England, description ; DOUGLAS, Ent. M. M. (2) ii, p. 44.  
*A. rubicola*, England, DOUGLAS, Ent. M. M. (2) ii, p. 322, n. sp.  
*Aspidiotus aurantii*, notes on in Cyprus ; SHIPLEY, Bull. Kew, 1891, pp. 221-230, pl. *A. bicarinatus*, Wlk., is a Lepidopterous larva ; GREEN, p. 503, Ann. N. H. (6) vi.  
*A. theæ*, Assam, MASKELL, p. 59, Ind. Mus. Notes, ii ; *A. corokiae*, p. 2, pl. ii, figs. 1-4, New Zealand, *cladii*, Australia, p. 3, pl. i, figs. 1-4, MASKELL, Tr. N. Z. Inst. xxiii : n. spp.  
*Bernardia*, n. g. ; *Lecaniini*, no species mentioned ; ASHMEAD, p. 100, Tr. Am. Ent. Soc. xviii.  
*Ceroplastes ceriferus*, notes on, with fig. ; COTES, Ind. Mus. Notes, ii, p. 93, pl. xvi, fig. 1.  
*Chionaspis theæ*, Kangra Valley, MASKELL, p. 60, Ind. Mus. Notes, ii, n. sp.  
*Coccus? laniger*, Ceylon, KIRBY, p. 175, pl. v, fig. 8, J. L. S. xxiv, n. sp.  
*Cælostoma assimile*, additional descriptions of early stages ; MASKELL, Tr. N. Z. Inst. xxiii, pp. 30 & 31, pl. vii, figs. 11-17.  
*C. pilosum*, New Zealand, MASKELL, Tr. N. Z. Inst. xxiii, p. 29, pl. vii, figs. 1-10, n. sp.  
*Dactylopius walkeri*, England, NEWSTEAD, Ent. M. M. (2) ii, p. 164 ; *D. herbicola*, Australia, MASKELL, p. 352, Agric. Gaz. N.S.W. ii : n. spp.  
*Diaspis pentagona*, report on ; FRANCESCHINI (301).  
*D. pinnulifera*, Fiji Is, MASKELL, Tr. N. Z. Inst. xxiii, p. 4, pl. i, figs. 13-16, n. sp.  
*Eriochiton cajani*, Madras, MASKELL, p. 61, pl. i, fig. 3, Ind. Mus. Notes, ii, n. sp.  
*Eriococcus hoheriae*, Mask., apterous ♂ noticed, *multispinus*, n. var. *laevigatus*, p. 20 : *E. pallidus*, variation, p. 21 ; MASKELL, Tr. N. Z. Inst. xxiii.  
*E. insignis*, p. 164, *fraxini*, p. 165, England, NEWSTEAD, Ent. M. M. (2) ii ; *E. danthoniae*, New Zealand, p. 21, pl. v, figs. 12-17, *leptospermi*, Australia, p. 22, pl. iv, figs. 9-13, MASKELL, Tr. N. Z. Inst. xxiii : n. spp.  
*Icerya rosæ*, figs. 1-3, *montserratensis*, figs. 4 & 5, *palmeri*, figs. 6 & 7, figured, pl. i, in RILEY, Rep. 1890.  
*Inglesia fagi*, New Zealand, MASKELL, Tr. N. Z. Inst. xxiii, p. 13, pl. iii, figs. 15-25, n. sp.  
*Leachia zealandica*, New Zealand, MASKELL, Tr. N. Z. Inst. xxiii, p. 26, pl. vi, fig. 1-17, n. sp.  
*Lecanium* : alteration of form of scales by parasites ; NEWSTEAD, Ent. M. M. (2) ii, p. 267. *L. oleæ*, noticed, p. 251, figured, pl. vii, fig. 1 ; RILEY, Rep. 1890. *L. longulum*, Dgl., = (*chirimoliae*, Mask.) ; MASKELL,



p. 16, Tr. N. Z. Inst. xxiii. *L. hispidum*, destroyed by a *Rhyzobius*; HUDSON, p. 111, Tr. N. Z. Inst. xxiii. *L. hesperidum*, note on the ♂ of; WASSILIEFF, Trav. Soc. Varsovie, ii, No. 6, pp. 10-12. *L. nigrum*, Niet., described; DOUGLAS, Ent. M. M. (2) ii, p. 95. *L. lauri*, specific characters; *id. t. c.* p. 244.

*L. sarothamni*, p. 65, *ciliatum*, p. 67, England, DOUGLAS, Ent. M. M. (2) ii; *L. distinguendum*, England, *id. t. c.* p. 96; *L. cassiniæ*, N. Zealand, p. 15, pl. ii, figs. 10-19, *frenchii*, Australia, p. 17, pl. iv, figs. 1-8, MASKELL, *t. c.*; *L. pruinorum*, California, COQUILLETT, Ins. Life, iii, p. 382: n. spp.

*Lecanochilton minor*, New Zealand, MASKELL, Tr. N. Z. Inst. xxiii, p. 12, pl. iii, figs. 1-14, n. sp.

*Monophlebus crawfordi*, note on; MASKELL, p. 28, Tr. N. Z. Inst. xxiii.

*Mytilaspis*: note on the characters and variation; MASKELL, Tr. N. Z. Inst. xxiii, pp. 4-6. *M. pomorum*, habits noticed; HUET, Bull. Soc. L. Norm. (4) v, p. 217.

*M. intermedia*, New Zealand, MASKELL, Tr. N. Z. Inst. xxiii, p. 7, pl. ii, figs. 5-9, n. sp.

*Orthezia occidentalis*, Colorado, p. 245, *prælonga*, Trinidad, p. 246, DOUGLAS, Ent. M. M. (2) ii, p. 247, n. spp.

*Parlatoria pittospori*, p. 11, pl. i, figs. 5-9, *myrtus*, p. 12, pl. i, fig. 10-12, Australia, MASKELL, Tr. N. Z. Inst. xxiii, n. spp.

*Poliaspis*, maintained as valid; MASKELL, Tr. N. Z. Inst. xxiii, pp. 9-11.

*Pulvinaria betulæ*, descriptive notes; DOUGLAS, Ent. M. M. (2) ii, p. 98. *P. oxyacanthæ*, food-plants; *id. t. c.* p. 307.

*P. maskelli*, Australia, p. 667, pl. lxii, Agric. Gaz. N.S.W., n. sp.

*Rhizæcus falcifer*, habits; KUNCKEL & SALIBA, Bull. Soc. Ent. Fr. 1891, p. cxvi, and C.R. cxiii, p. 227.

*Rhizococcus totaræ*, Mask., ♂ noticed; MASKELL, p. 19, Tr. N. Z. Inst. xxiii.

*R. intermedius*, New Zealand, MASKELL, Tr. N. Z. Inst. xxiii, p. 19, n. sp.

*Rippersia fagi*, New Zealand, MASKELL, Tr. N. Z. Inst. xxiii, p. 24, pl. iv, figs. 15-20, n. sp.

*Solenophora corokiæ*, additional characters; MASKELL, p. 18, pl. v, figs. 1-7, Tr. N. Z. Inst. xxiii.

## (ANOPLURA.)

[Cf. MEINERT (574), OSBORN (640, 641).]

The lice should form a distinct order to be called *Siphunculata*; MEINERT, Ent. Medd. iii, p. 69.

Origin of parasitic habit in *Pediculidæ*; OSBORN (641).

Pediculi of man and the lower animals; OSBORN (640).

✓ *Hæmatopinoides*, n. g., for *H. squamosus*, n. sp., N. America, fig. 16; OSBORN, p. 28, Bull. Dep. Agric. Ent. No. 7.

*Hæmatopinus urius*, structure of mouth ; MEINERT, Ent. Medd. pp. 68-82, pl. i.

*H. sciuropteri*, p. 23, fig. 12, *antennatus*, p. 25, fig. 13, *hesperomydis*, p. 26, fig. 14, *suturalis*, p. 27, fig. 15, N. America, OSBORN, Bull. Dep. Agric. Ent. No. 7, n. spp.

*Pediculus capitis* and *vestimenti* are one species ; MEINERT, Ent. Medd. iii, p. 58.

*Phthirius inguinalis*, habits ; TROUESSART, C.R. cxiii, p. 1067.

(F). *NEUROPTERA*.

TRICHOPTERA.

[Cf. CHATIN (139), CLARKE (151), LINDEN (541), MARTENS (565), MULLER (606), THOMSON (858).]

Classification discussed ; THOMSON, Op. Ent. xv, pp. 1537-1545.

Structure of trophi ; CHATIN, Bull. Soc. Philom. (8) iii, p. 53.

Synonymical list of the *Trichoptera* of Zetterstedt and Sundwall preserved in the Museum at Lund ; THOMSON, Op. Ent. xv, pp. 1545-1555.

Revision of the Swedish *Phryganeina* and *Limnophilina* ; THOMSON, Op. Ent. xv, pp. 1555-1600.

Catalogue of the *Trichoptera* of Spain ; MAZARREDO & BOLIVAR, Act. Soc. Esp. xx, pp. 81-95.

Observations on spiral cases ; MARTENS (565).

Habits and cases of larvæ in Massachusetts ; CLARKE, Psyche, vi, pp. 153-158, woodcuts.

√ *Arctopora*, n. subg. of *Anabolia* ; THOMSON, p. 1592, Op. Ent. xv.

*Calamoceras volxemi*, habits in France ; MARTIN, p. clxiv, Bull. Soc. Ent. Fr. 1891.

√ *Conotaulius*, n. subg. of *Limnephilus* ; THOMSON, Op. Ent. xv, p. 1571.

*Limnephilus luniger*, *hyperboreus*, Sweden, THOMSON, p. 1576, Op. Ent. xv, n. spp.

√ *Parachiona*, n. subg. of *Anabolia* ; THOMSON, p. 1592, Op. Ent. xv.

*Phryganea striata*, habits ; LINDEN, Biol. Centralbl. xi, pp. 71-73.

√ *Spilotaulius*, n. subg. of *Limnephilus* ; THOMSON, p. 1588, Op. Ent. xv.

NEUROPTERA-PLANIPENNIA.

[Cf. ALBARDA (4), MACLACHLAN (556, 557), RODZIANKO (743).]

*Raphidiides* : ALBARDA revises the group, with copious synonymy, detailed descriptions, and numerous figures ; Tijdschr. Ent. xxxiv, pp. 65-184, pls. ii-xi.

*Acanthaclisis occitanica*, and others, note on (in Russian) ; RODZIANKO (743).

√ *Allocormodes*, n. n. for *Cormodes*, MacLach., nec Pascoe ; MACLACHLAN, p. 512, Tr. E. Soc. 1891.

↓ *Campylophlebia*, n. g. *Holophthalmi*, p. 510, for *C. magnifica*, n. sp., Cameroons, p. 511; MACLACHLAN, Tr. E. Soc. 1891.

*Hemerobiinae*: the parasites of in N. America; HOWARD, P. E. Soc. Wash. ii, pp. 123 & 124.

*Ildricerus elwesii*, Darjeeling, p. 512, *japonicus*, Japan, p. 513, *J.* (?) *albardanus*, Mesopotamia, p. 514, MACLACHLAN, Tr. E. Soc. 1891, n. spp.

*Inocellia maclachlani*, Sardinia, p. 162, pl. x, fig. 20, *braueri*, S. Europe, p. 165, pl. xi, fig. 30, *longicornis*, p. 169, pl. xi, fig. 32, *hageni*, p. 171, pl. xi, fig. 33, California, ALBARDA, Tijdschr. Ent. xxxiv, n. spp.

*Isoclipteron fulvum*, Costa, ♀ noticed; MACLACHLAN, Ent. M. M. (2) ii, p. 308.

*Psychopsis*, notes on the species; MACLACHLAN, Ent. M. M. (2) ii, p. 321.

*P. birmana*, Burma, MACLACHLAN, Ent. M. M. (2) ii, p. 312, n. sp.

*Ptynx furciger*, Arizona, MACLACHLAN, p. 509, Tr. E. Soc. 1891, n. sp.

*Raphidia pontica*, Asia Minor, p. 103, pl. iv, fig. 6, *etrusca*, Tuscany, p. 113, pl. v, fig. 10, *insularis*, Sicily, p. 117, pl. v, fig. 12, *sericea*, Europe, p. 122, pl. vi, fig. 14, *adanana*, Asia Minor, p. 138, pl. vii, fig. 20, *ligurica*, N. Italy, p. 140, pl. viii, fig. 21, *nigricollis*, Frankfort-on-M. p. 142, pl. viii, fig. 22, *assimilis*, Vancouver, p. 144, pl. viii, fig. 23, *bicolor*, Colorado, p. 152, pl. ix, fig. 24, ALBARDA, Tijdschr. Ent. xxxiv, n. spp.

#### THYSANURA.

[Cf. DALLA TORRE (173), MACGILLIVRAY (555), PARFITT (645), SCHÄFFER (764), SCHÖTT (776).]

List of *Thysanura* and *Collembola* of N. America; MACGILLIVRAY, Canad. Ent. xxiii, pp. 267-273.

List of Tyrolese *Thysanura*, with synonymical and other remarks; DALLA TORRE (173).

*Achorutes elegans*, England, PARFITT, Rep. Devon. Ass. xxiii, p. 346, n. sp.

*Anurida tullbergi*, Upland and Finland, SCHÖTT, Ent. Tidskr. xii, p. 192; *A. steineni*, South Georgia I., SCHÄFFER, JB. Hamb. ix, p. 200: n. spp.

*Isotoma georgiana*, South Georgia I., SCHÄFFER, JB. Hamb. ix, p. 197, n. sp.

↓ *Tetracanthella*, n. g. *Lipuridae*, p. 191, for *T. pilosa*, n. sp., Norway, p. 192; SCHÖTT, Ent. Tidskr. xii.

*Tullbergia grisea*, S. Georgia, SCHÄFFER, JB. Hamb. ix, p. 199, n. sp.

#### MALLOPHAGA.

[Cf. NEUMANN (612, 613), OSBORN (640, 641).]

The *Mallophaga* of N. America ; OSBORN (640).

Origin of parasitism in *Mallophaga* ; OSBORN (641).

List of the *Ricinidæ* found on birds of the family *Psittacidæ* ; NEUMANN, Bull. Soc. Toulouse, xxiv, pp. 55, &c.

*Docophorus labidion*, p. 84, pl., fig. 1, *arcunotatus* on *Eclectus polychlorus* from New Guinea, p. 85 ; NEUMANN, Bull. Soc. Toulouse, xxv, n. spp.

*Lipeurus trabeculus*, Piag., male described, referred to *Nirmus* ; NEUMANN, p. 63, Bull. Soc. Toulouse, xxiv. *L. strepsiceros*, var. described and figured ; *op. cit.* xxv, p. 86, pl., fig. 3.

*L. forficuloides* on *Platycercus multicolor*, from N. S. Wales, NEUMANN, Bull. Soc. Toulouse, xxiv, p. 65, and xxv, p. 87, pl., fig. 4, n. sp.

*Menopon commissum* on *Microglossum alecto*, from N. Guinea, NEUMANN, p. 66, Bull. Soc. Toulouse, xxiv ; *M. spinimentum* on *Chalcopsittacus fuscatus*, from N. Guinea, *id. op. cit.* xxv, p. 88, pl., fig. 5 ; *M. imbricatum* on *Chlorolompis elegans*, p. 91, pl., fig. 7 : n. spp.

*Nirmus ligulatus* on *Chrysotis brasiliensis*, p. 60, *ovalis* on *Dasyptilus pecqueti* and *Eclectus polychlorus*, p. 61, *divergens* on *Pezoporus formosus*, from N. S. Wales, p. 62, NEUMANN, Bull. Soc. Toulouse, xxiv, n. spp.

*Trichodectes geomydis*, N. America, OSBORN, p. 54, fig. 42, Bull. Dep. Agric. Ent. No. 7, n. spp.

#### THYSANOPTERA.

*Thrips secalina* and *Phlæothrips frumentaria*, habits ; HOFMANN, JH. Ver. Würt. xlvii, pp. 24-28.

#### TERMITIDÆ and EMBIIDÆ.

Termitophilous insects discussed : WASMANN (934).

*Termes monodon*, p. 185, *falciger*, p. 186, E. Africa, GERSTÄCKER, JB. Hamb. ix, n. spp.

*Olynta staphylinoides* referred to *Forficulidæ* ; KIRBY, p. 506, J. L. S. xxiii.

#### PSOCIDÆ.

[Cf. TETENS (855).]

*Amphigerontia*, Kolbe, note on, and reference to the *Psocidæ* of the *Neuroptera germanica* ; TETENS, Ent. Nachr. xvii, p. 373.

*Atropos pulsatoria* ticking ; GAHAN, p. xxxii, P. E. Soc. 1891.

*Cæcilius gynapterus*, pp. 372 & 380, *rufus*, pp. 372 & 381, *rhenanus*, *kolbei*, pp. 372 & 382, Germany, TETENS, Ent. Nachr. xvii, n. spp.

*Elipsocus moebiusi*, Rhineland, TETENS, pp. 372 & 379, Ent. Nachr. xvii, n. sp.

*Hemineura*, n. g., for *H. dispar*, n. sp., Germany ; TETENS, pp. 372 & 379, Ent. Nachr. xvii.

† *Holoneura*, n. g., pp. 372 & 378, for *Elipsocus laticeps*, Kolbe, and *Mesopsocus unipunctatus*, Müll. ; TETENS, Ent. Nachr. xvii.

*Lepinotus piceus*, L.?, *sericeus*, Kolbe, notes on ; TETENS, p. 384, Ent. Nachr. xvii. *L. inquilinus*, Heyd., = (*Paradoxides psocoides*, Motsch.) ; TETENS, p. 1, S.B., B. E. Z. 1891.

*Psocus bifasciatus*, Latr., *subnebulosus*, Steph., *bipunctatus*, L., *nebulosus*, Steph., synonymical and descriptive notes on ; TETENS, pp. 374–377, Ent. Nachr. xvii.

*P. intermedius*, Germany, TETENS, p. 374, Ent. Nachr. xvii, n. sp.

#### ODONATA.

[Cf. CALVERT (127), KARSCH (449–456), KIRBY (469), RODZIANKO (742), SELYS (793, 794).]

Destruction of Dragon-flies by birds ; MARTIN, Bull. Soc. Ent. Fr. 1891, pp. clxix–clxxi.

Classification of the *Æschnides* discussed, and a new arrangement proposed, with characters of the genera ; KARSCH, pp. 273–290, Ent. Nachr. xvii.

*Æschna furcifera*, Mexico, KARSCH, p. 310, Ent. Nachr. xvii, n. sp.

*Agriocnemis gratiosa*, Zanzibar, GERSTÄCKER, JB. Hamb. ix, p. 193, n. sp.

*Allorrhizucha preussi*, W. Africa, KARSCH, p. 80, Ent. Nachr. xvii, n. sp.

*Amphizæschna simplicia*, Borneo, KARSCH, p. 309, Ent. Nachr. xvii, n. sp.

*Amphilestes mimas*, Sumatra, KARSCH, p. 242, Ent. Nachr. xvii, n. sp.

*Anax concolor* and *longipes* are probably one species ; Psyche, vi, p. 118.

*A. junius*, period of its development ; FISCHER, Ent. News, ii, p. 180.

*Archibasis ceylonica*, Kandy, KIRBY, p. 205, pl. xx, fig. 4, P. Z. S. 1891, n. sp.

† *Archiclops*, n. g., near *Cannaphila*, p. 78, for *A. infestus*, n. sp., W. Africa, p. 79 ; KARSCH, Ent. Nachr. xvii.

*Cephalæschna sikkima*, N. India, KARSCH, p. 311, Ent. Nachr. xvii, n. sp.

*Cora klenei*, Ecuador, KARSCH, p. 113, Soc. Ent. vi, n. sp.

*Diplax*: copulatory habits ; RODZIANKO (742). *D. trivialis*, Sel., referred to *Diplacodes* ; KARSCH, p. 246, Ent. Nachr. xvii.

*Disparoneura delia*, Sumatra, KARSCH, p. 243, Ent. Nachr. xvii, n. sp.

*Epizæschna debilis*, Brazil, KARSCH, p. 286 & 311, Ent. Nachr. xvii, n. sp.

*Erythrodiplax ponderosa*, Ecuador, KARSCH, Soc. Ent. vi, p. 113, n. sp.

*Gynacantha plagiata*, ♂ described ; KARSCH, p. 245, Ent. Nachr. xvii.

*G. membrunalis*, Bogota, p. 305, *bullata*, p. 306, *vesiculata*, p. 307, *cylindrata*, p. 308, W. Africa, KARSCH, Ent. Nachr. xvii ; *G. caudata*, *tibiata*, Ecuador, KARSCH, p. 121, Soc. Ent. vi : n. spp.

†*Hadrothemis*, n. g., near *Thermothemis*, for *Orthetrum camarensis*, Kirby; KARSCH, p. 75, Ent. Nachr. xvii.

*Hypocnemis cornuta*, ♀ described; SELYS, p. 217, An. Soc. Esp. xx.

*Idionyx montana*, Java, KARSCH, p. 30, Ent. Nachr. xvii, n. sp.

*Jagoria*, Karsch, and *Oligoæschna*, Selys, both published in 1889, are synonymous; KARSCH, p. 289, Ent. Nachr. xvii.

*Lestes eurinus*, Say, redescribed; SCUDDER, Psyche, vi, p. 66.

*Libellago*, Sel.: notes on the African species, with characters of *L. rubida*, Sel., and *dispar*, Beauv.; KARSCH, Ent. Nachr. xvii, pp. 70 & 71.

*Libellula quadrimaculata*, swarms on the I. of Juist; ALFKEN, Abh. Ver. Brem. xii, pp. 107 & 108.

*L. (Trithemis) ardens*, p. 187, *stuhlmanni*, p. 188, E. Africa, GERSTÄCKER, JB. Hamb. ix, n. spp.

†*Mesocnemis*, n. g., *Agrionides*, near *Metacnemis*, p. 66, for *M. singularis*, n. sp., W. Africa, p. 67; KARSCH, Ent. Nachr. xvii.

*Micromerus martinæ*, Sumatra, KARSCH, p. 244, Ent. Nachr. xvii, n. sp.

†*Nesobasis*, n. subg. of *Agrion*, p. li, for *N. erythrope*, p. liii, *telegastrum*, p. liv, *flavilabris*, p. lv, *nigrostigma*, p. lvi, *longistyla*, p. lvii, n. spp., Fiji Is.; SELYS, C.R. Ent. Belg. xxxv.

†*Nesocnemis*, n. subg. (*Agrionines*, near *Prionocnemis*), p. cccci, for *N. sinuatipennis*, n. sp., Madagascar, p. cccii; SELYS, C.R. Ent. Belg. xxxv.

†*Nesolestes*, n. subg. (*Podagrions*), p. cccxcix, for *N. alboterminata*, n. sp., Madagascar, p. cccc; SELYS, C.R. Ent. Belg. xxxv.

†*Neuragrion*, n. g. (*Agrionidae*), for *N. mysticum*, n. sp., Ecuador; KARSCH, p. 105, Soc. Ent. vi.

*Neurobasis apicalis*, Ceylon, KIRBY, p. 204, pl. xx, figs. 2 & 2a, P. Z. S. 1891, n. sp.

*Orthemis nodiplaga*, S. America, KARSCH, p. 267, Ent. Nachr. xvii, n. sp.

*Orthetrum carnicum*, figured, pl. xx, fig. 1; KIRBY, P. Z. S. 1891.

*O. leoninum*, Sierra Leone, KARSCH, Ent. Nachr. xvii, p. 59, n. sp.

†*Ortholestes*, n. g., for *O. clara*, n. sp., Jamaica; CALVERT, p. 199, Ent. News, ii.

†*Platyplax*, n. g., near *Sympetrum*, p. 268, for *P. erythropyga*, n. sp., Uruguay, p. 270; KARSCH, Ent. Nachr. xvii.

*Platysticta greeni*, Ceylon, KIRBY, p. 204, pl. xx, figs. 3 & 3a, P. Z. S. 1891, n. sp.

*Pseudagrion epiphonematicum*, Cameroons, KARSCH, p. 68, Ent. Nachr. xvii, n. sp.

*Pseudomacromia*, note on affinities and characters; KARSCH, Ent. Nachr. xvii, p. 73. *P. elegans*, *pretiosa*, notes on; MACLACHLAN, Ent. M. M. (2) ii, p. 111.

*P. pretiosa*, W. Africa, KARSCH, Ent. Nachr. xvii, p. 74, pl. ii, n. sp.

*Rhinocyphu semitincta*, validity, &c., discussed ; SELYS, pp. 213-215, An. Soc. Esp. xx.

*R. turconii*, Philippines, SELYS, p. 215, An. Soc. Esp. xx, n. sp.

*Sapho orichalcea*, Mac L., and *pulchella*, Kirby, note on ; KARSCH, p. 69, Ent. Nachr. xvii.

*Thermorthemis*, Kirby, characters discussed and amended ; KARSCH, pp. 58 & 59, Ent. Nachr. xvii.

*T. coacta*, p. 60, *defecta*, *versuta*, p. 61, W. Africa, KARSCH, Ent. Nachr. xvii, n. spp.

*Zygonyx*: the genus and its two species, *ida*, *iris*, redescribed ; SELYS, pp. cccxvi-ccxxx, C.R. Ent. Belg. xxxv.



## (G.) ORTHOPTERA.

[Cf. BERG (54), BRONGNIART (98, 99, 101, 102), BRUNER (103, 104, 105), BRUNNER (107), COSTA (161), COTES (165, 166), GARMAN (322), HART (374), HEYMONS (391), KARSCH (457-461), KIRBY (470-474), KRAUSS (493), KUNCKEL (497, 498), KUNCKEL & LANGLOIS (500, 501), LEWIS (538), MACNEIL (558), MESSEA (578), PICTET & SAUSSURE (656), REDTENBACHER (687), RIGGIO (719), RILEY (722, 723), SAUSSURE (762), SIMONOT-REVOL (813), VIALLANES (905, 906) WOOD-MASON (968).]

Notes on the habits of the *Orthoptera* of Illinois; McNEILL, *Psyche*, vi, pp. 3, &c., &c.

## FORFICULIDÆ.

Table of the characters of the genera; KIRBY, pp. 504 & 505, J. L. S. xxiii.

*Anisolabis rufescens*, Cameroons, pl. xii, fig. 10, *xenia*, Norfolk I., *antennata*, Bermuda, KIRBY, p. 517, J. L. S. xxiii, n. spp.

*Chelisoches tenebrator*, India, p. 521, pl. xii, fig. 5, *C. ? picticornis*, Philippines, fig. 4, p. 522, KIRBY, J. L. S. xxiii, n. spp.

*Cylindrogaster nigriceps*, Hong Kong, *junsoni*, Chontales, KIRBY, p. 507, J. L. S. xxiii, n. spp.

*Demogorgon*, n. g., near *Labidura*, p. 513, for *D. batesi*, Santarem, *bicolor*, S. America, p. 514, *adelphus*, Brazil, *patagonicus*, Patagonia, pl. xii, fig. 2, p. 515, n. spp., KIRBY, J. L. S. xxiii.

*Echinosoma forbesi*, Dinner I., KIRBY, p. 509, pl. xii, fig. 9, J. L. S. xxiii, n. sp.

*Forficula coriacea*, Sierra Leone, *picta*, Zululand, *planicollis*, N. India, KIRBY, p. 525, J. L. S. xxiii, n. spp.

*Labia buprestoides*, p. 519, pl. xii, fig. 8, *tricolor*, *L. ? glabricula*, p. 520, Amazons, KIRBY, J. L. S. xxiii, n. spp.

*Labidura ? pugnax*, N. India, p. 510, pl. xii, fig. 1, *decipiens*, Assam, *granulosa*, Philippines, p. 511, *pluvialis*, Raine I., *clarki*, Rio Janeiro, p. 512, *morosa*, hab. ?, p. 513, KIRBY, J. L. S. xxiii, n. spp.

*Nannopygia dohrni*, Ceylon, KIRBY, p. 508, J. L. S. xxiii, n. sp.

*Opisthocosmia humeralis*, Ceylon, *O. ? cervipyga*, pl. xii, fig. 12, Sarawak, KIRBY, p. 523, J. L. S. xxiii, n. spp.

*Platylabia nigriceps*, Dorey, KIRBY, p. 518, J. L. S. xxiii, n. sp.

*Psalis* ? *picina*, Gambia, KIRBY, p. 516, J. L. S. xxiii, n. sp.

*Pygidicrana horsfieldi*, Java, KIRBY, p. 506, J. L. S. xxiii, n. sp.

*Sparattu horsfieldi*, Java, KIRBY, p. 519, J. L. S. xxiii, n. sp.

*Sphingolabis variegata*, Sierra Leone, *bipartita*, India, p. 526, *S.* ? *subaptera*, Queensland, p. 527, *spiculifera*, New South Wales, pl. xii, fig. 7, *binotata*, Colombia, p. 528, *S.* ? *perplexa*, Rio, *meridionalis*, Theresopolis, p. 529, KIRBY, J. L. S. xxiii, n. spp.

*Spongophora dysoni*, Venezuela, KIRBY, p. 521, pl. xii, fig. 6, J. L. S. xxiii, n. sp.

#### BLATTIDÆ.

↓ *Ateloblatta*, n. g., near *Gromphadorrhina*, for *A. cambouini*, *granulata*, *malagassa*, n. spp., Madagascar, SAUSSURE, p. 10, Soc. Ent. vi.

*Blatta* (*Phyllodromia*) *lobata*, *sikora*, p. 25, *latipennis*, p. 26, Madagascar, SAUSSURE, Soc. Ent. vi, n. spp.

↓ *Compsoblatta*, n. g., *Perisphærinæ*, p. 9, for *C. amaena*, *venusta*, *pulchella*, p. 10, *suava*, *metallica*, p. 26, n. spp., Madagascar ; SAUSSURE, Soc. Ent. vi.

*Derocalymma brunneriana*, Cape Good Hope, COSTA, p. 18, pl. iii, fig. 9, Atti Ac. Napoli (2) iv, No. 5, n. sp.

*Deropeltis madecassa*, Madagascar, SAUSSURE, p. 17, Soc. Ent. vi ; *D. sculpturata*, S. Thomé I., KRAUSS, p. 651, pl. xlv, fig. 2, Zool. Jahrb. v, Abth. Syst. : n. spp.

*Epilampra angulata*, *trilobata*, *punctulata*, Madagascar, SAUSSURE, Soc. Ent. vi, p. 25, n. spp.

↓ *Elliptoblatta*, n. g., p. 9, for *P. madecassa*, Sss., and *E. hova*, n. sp., p. 26; SAUSSURE, Soc. Ent. vi.

↓ *Hemiblatta*, n. g., for *P. ciliata*, B.; SAUSSURE, p. 9, Soc. Ent. vi.

↓ *Heminauphoeta*, n. g., for *H. sakalava*, n. sp., Madagascar ; SAUSSURE, p. 17, Soc. Ent. vi.

*Heterogamia maris-mortui*, Dead Sea, JANSON, in Hart's Fauna and Flora of Sinai, p. 184, pl. fig. 3, n. sp.

*Loboptera duplovittata*, Madagascar, SAUSSURE, p. 25, Soc. Ent. vi, n. sp.

*Nauphoeta heydeniana*, *madecassa*, Madagascar, SAUSSURE, Soc. Ent. vi, p. 17, n. spp.

*Panchlora viridis* is viviparous ; RILEY, P. E. Soc. Wash. ii, p. 192, and Ins. Life, iii, p. 443, and iv, p. 119 : young described and figured ; RILEY, Ins. Life, iii, p. 444, fig. 33.

*Periplaneta spinulifera*, S. Thomé I., KRAUSS, Zool. Jahrb. v, Abth. Syst. p. 650, pl. xlv, fig. 1 ; *P. hova*, Madagascar, SAUSSURE, p. 17, Soc. Ent. vi : n. spp.

*Phyllodromia germanica*, embryology of ♀ sexual organs ; HEYMONS (391).

↓ *Pseudoderopeltis*, n. g., for *Deropeltis antennata*, Sauss., and *P. granulifera*, Makalakaland, p. 653, *flavescens*, S. Africa, p. 654, *triimpressa*,

S. Thomé I. p. 656, pl. xlv, fig. 3, n. spp. ; KRAUSS, Zool. Jahrb. v, Abth. Syst.

*Temnopteryx panteli*, *sakalava*, Madagascar, SAUSSURE, p. 25, Soc. Ent. vi, n. spp.

*Theganopteryx conspersa*, *punctata*, Madagascar, SAUSSURE, p. 26, Soc. Ent. vi, n. spp.

## MANTIDÆ.

*Mantis religiosa*, embryology ; VIALLANES (905, 906).

*Mantis religiosa*, mode of stridulation ; SIMONOT-REVOL (813).

*Theopompa taprobanarum*, Ceylon, p. 62, *septentrionum*, Assam, p. 64, WOOD-MASON, Cat. Mant., n. spp.

## PHASMATIDÆ.

✓ *Enetia*, n. g. near *Acrophylla*, for *E. spinosissima*, n. sp., Madagascar ; KIRBY, p. 151, Ann. N. H. (6) viii.

## GRYLLIDÆ.

Caudal glands in the male of *Hadenæcus subterraneus*, GARMAN, Psyche, vi, p. 105.

*Cycloptilus borealis*, Nebraska, BRUNER, p. 37, Canad. Ent. xxiii, n. sp.

*Dyscophus onthophagus*, Uruguay, BERG, p. 6, An. Soc. Arg. xxxii, n. sp.

*Gryllotalpa* attacked by *Stylops* ; SCHWARZ, P. E. Soc. Wash. ii, p. 70.

*Gryllus neglectus*, cannibalism in ; BRODIE, Canad. Ent. xxiii, p. 137.

*Æcanthus niveus*, *fasciatus*, *angustipennis*, specific distinctions and habits noticed ; MCNEILL, Psyche, vi, pp. 6-8.

*Orocharis uhleri*, Illinois, MCNEILL, Psyche, vi, p. 8, n. sp.

## LOCUSTIDÆ.

*Conocephalides* monographed ; REDTENBACHER, Verh. z.-b. Wien. xli, pp. 315-562, pls. iii & iv. The synonymy given in this important paper is not reproduced below, where only the new species and genera are given.

Notes on the *Mecopodidæ* ; KIRBY, Tr. E. Soc. 1891, pp. 405-412. Much synonymy is given, without indication of what part thereof is new.

Supplement to the monograph of *Phaneropterides*, with new table of classification and genera ; BRUNNER, Verh. z.-b. Wien, xli.

*Prochilides* : notes on the composition of the group, and table of the characters of the genera ; KARSCH, Ent. Nachr. xvii, pp. 97-100.

*Pseudophyllides* : characters of the African genera in tabular form ; KARSCH, B. E. Z. xxxvi, pp. 75-79.

↓ *Abrodiata*, n. g., *Phaneropterides*, for *A. lanceolata*, pl. ii, fig. 29, n. sp., Upp. Amazons ; BRUNNER, p. 150, Verh. z.-b. Wien, xli.

↓ *Acauloplax*, n. g., *Pseudophyllides*, for *A. exigua*, n. sp., Tropical Africa, pl. iii, fig. 9 ; KARSCH, p. 95, B. E. Z. xxxvi.

↓ *Acrodonta*, n. g., *Conocephalides*, for *A. subaptera*, pl. iii, fig. 59, Ceylon, n. sp. ; REDTENBACHER, p. 446, Verh. z.-b. Wien, xli.

↓ *Adapantus*, n. g., *Pseudophyllides*, p. 103, for *A. bardus*, pl. iv, fig. 14, *egenus*, p. 105, n. spp., Cameroons ; KARSCH, B. E. Z. xxxvi.

↓ *Adenes*, n. g., *Pseudophyllides*, p. 112, for *A. obesus*, pl. iv, fig. 18, *gravidus*, n. spp., W. Africa, p. 113 ; KARSCH, B. E. Z. xxxvi.

↓ *Æthiomerus*, n. g., *Conocephalides*, for *Æ. madagassus*, pl. iii, fig. 53, p. 437, *adelphus*, p. 438, n. spp., Madagascar ; REDTENBACHER, Verh. z.-b. Wien, xli.

↓ *Agaura*, n. g., *Phaneropterides*, for *A. mirabilis*, n. sp., Upp. Amazons, pl. ii, fig. 26 ; BRUNNER, p. 135, Verh. z.-b. Wien, xli.

↓ *Agemis*, n. g., *Phaneropterides*, for *A. parallelinervis*, n. sp., Madagascar ; BRUNNER, p. 151, Verh. z.-b. Wien, xli.

↓ *Agnapha*, n. g., *Phaneropterides*, for *A. fusca*, n. sp., Waigiou ; BRUNNER, p. 108, Verh. z.-b. Wien, xli.

*Agræcia*, *viridipennis*, *subulata*, *nigrifrons*, Brazil, p. 453, *sansibara*, Zanzibar, *vittata*, Columbia, *vittipes*, Brazil, p. 454, *maculata*, p. 455, *abbreviata*, Brazil, *differens*, N. Australia, p. 456, REDTENBACHER, Verh. z.-b. Wien, xli, n. spp.

*Alectoris superba*, Brunner, description and figure ; BRUNNER, p. 95, pl. i, fig. 15, Verh. z.-b. Wien, xli.

↓ *Alphopteryx*, n. g., *Conocephalides*, for *A. 10-maculata*, n. sp., Australia ; REDTENBACHER, p. 463, Verh. z.-b. Wien, xli.

*Amaura longicercata*, Theresopolis, *olivacea*, Rio Grande do Sul, BRUNNER, p. 123, Verh. z.-b. Wien, xli, n. spp.

*Amblycorypha scudderae*, Nebraska, BRUNER, p. 73, Canad. Ent. xxiii, n. sp.

↓ *Amblylakis*, n. g., *Conocephalides*, p. 487, for *A. nigrolimbata*, *inermis*, p. 488, n. spp., Madagascar ; REDTENBACHER, Verh. z.-b. Wien, xli.

*Anaulacomera brevicauda*, Peru, *olivacea*, p. 144, *albonodulosa*, Upp. Amazons, *diluta*, Peru, *gracilis*, Venezuela, p. 145, *dilineata*, *unicolor*, p. 146, *angusta*, *sororcula*, Upp. Amazons, *boliviana*, Bolivia, p. 147, *clavata*, Brazil, *biramosa*, Venezuela ?, *acuminata*, Queensland, p. 148, BRUNNER, Verh. z.-b. Wien, xli, n. spp.

↓ *Anchispora*, n. g., *Phaneropterides*, for *A. appendiculata*, pl. ii, fig. 21, n. sp., Madagascar ; BRUNNER, p. 119, Verh. z.-b. Wien, xli.

↓ *Anelytra*, n. g., *Conocephalides*, p. 438, for *A. nigrifrons*, Australia,

*punctata*, Burma, p. 438, *concolor*, Bombay, p. 439, and including *Agræcia lateralis*, Er. ; REDTENBACHER, Verh. z.-b. Wien, xli.

*Anepitactæ*: new group of *Phaneropterides* for the following :

† *Anepitacta*, n. g., for *A. inconspicua*, pl. ii, fig. 34, n. sp., Cameroons ; BRUNNER, p. 178, Verh. z.-b. Wien, xli.

† *Angara*, n. g., *Phaneropterides*, p. 37, for *A. albofasciata*, n. sp., Brazil, p. 38, pl. i, fig. 1 ; BRUNNER, Verh. z.-b. Wien, xli.

*Aniara proxima*, Sta. Catherina, BRUNNER, p. 58, Verh. z.-b. Wien, xli, n. sp.

*Anisotochra*, Karsch, merged in *Hemielimæa* ; BRUNNER, p. 51, Verh. z.-b. Wien, xli.

† *Anthracites*, n. g., *Conocephalides*, p. 466, for *A. nitidus*, n. sp., Philip-pines, p. 467 ; REDTENBACHER, Verh. z.-b. Wien, xli.

*Arantia gabunensis*, Gaboon, p. 64, *atrolineata*, Slave Coast, p. 69, BRUNNER, Verh. z.-b. Wien, xli, n. spp.

† *Arota*, n. g., *Phaneropterides*, for *A. alineata*, pl. ii, fig. 31, n. sp., Upp. Amazons, BRUNNER, p. 169, Verh. z.-b. Wien, xli.

*A. rosaura*, Ecuador, KARSCH, Soc. Ent. vi, p. 89, n. sp.

*Barbitistes oertzeni*, Greece, BRUNNER, p. 32, Verh. z.-b. Wien, xli, n. sp.

† *Baryprostha*, n. g., *Phaneropterides*, p. 211, for *B. bellua*, n. sp., Sumatra, p. 212, woodcut ; KARSCH, B. E. Z. xxxvi.

† *Brachymetopa*, n. g., p. 430, for *Conocephalus blackburni*, Borm., and *B. discolor*, n. sp., Honolulu, p. 431, pl. iii, fig. 49 ; REDTENBACHER, Verh. z.-b. Wien, xli.

*Cædicia nigrospinosæ*, Cameroons, BRUNNER, Verh. z.-b. Wien, xli, p. 97, n. sp.

† *Calopsyræ*, n. g., *Phaneropterides*, for *Phylloptera octo-maculata*, Westw. ; BRUNNER, p. 85, Verh. z.-b. Wien, xli.

*Casigneta lamellosa*, Celebes, BRUNNER, p. 77, Verh. z.-b. Wien, xli, n. sp.

† *Caulopsis*, n. g., p. 376, for *Conocephalus cuspidatus*, Scudd., and *C. gracilis*, n. sp., S. America, p. 377, pl. iii, fig. 25 ; REDTENBACHER, Verh. z.-b. Wien, xli.

† *Ceraia*, n. g., *Phaneropterides*, p. 128, for *C. tibialis*, Upp. Amazons, *maxima*, Bolivia, *surinamensis*, Surinam, p. 129, *cornuta*, *atrosignata*, Upp. Amazons, p. 130, *zebrata*, Peru, p. 131, n. spp., including also the species from S. America previously referred to *Scudderia* ; BRUNNER, Verh. z.-b. Wien, xli.

† *Cestrophorus*, n. g., *Conocephalides*, for *C. paradoxus*, n. sp., Madagascar, pl. iv, fig. 78 ; REDTENBACHER, p. 491, Verh. z.-b. Wien, xli.

*Ceuthophilus pallescens*, Nebraska, BRUNER, p. 38, Canad. Ent. xxiii, n. sp.

*Chondrodera subvitrea*, W. Africa, KARSCH, p. 95, B. E. Z. xxxvi, n. sp.

† *Conchophora*, n. g., *Conocephalides*, for *C. spinigera*, p. 486, *subulata*, p. 497, n. spp., Madagascar ; REDTENBACHER, Verh. z.-b. Wien, xli.

*Conocephalus nebrascensis*, Nebraska, BRÜNER, p. 72, Canad. Ent. xxiii ; *C. flavirostris*, Brazil, p. 386, pl. iii, fig. 27, *carinatus*, Upp. Amazons, *nigricans*, Brazil, p. 388, *procerus*, Buenos Ayres, *truncatirostris*, Brazil, p. 389, *nigromaculatus*, Uruguay, pl. iii, fig. 31, p. 390, *nigropunctatus*, S. America, Cuba, p. 391, fig. 32, *elongatus*, Peru, *muticus*, Antilles, p. 393, *affinis*, Madagascar, p. 394, *pustulatus*, p. 395, *maculosus*, p. 396, Brazil, *brevis*, Montevideo, *obscurus*, Centr. & S. America, p. 397, *fuscomarginatus*, Brazil, p. 398, *fuscostratus*, N. America, Antilles, *frater*, Antilles, Amazons, p. 399, *brachypterus*, Brazil, *adustus*, Cuba, p. 400, *conifrons*, *globifer*, Brazil, *nigrolimbatus*, Cuba, p. 401, *macropterus*, America, *necessarius*, Mexico, p. 402, *testaceus*, p. 403, *rufescens*, p. 404, Brazil, *argentinus*, *vittifrons*, Buenos Ayres, p. 406, *parvus*, Uruguay, *anodon*, Brazil, p. 407, *indicus*, E. India, Australia, *coniceps*, Borneo, p. 408, *saussurei*, Sumatra, p. 409, *pyrifer*, Borneo, *picteti*, p. 410, *ustulatus*, Sumatra, *cornutus*, Australia, &c., *mimeticus*, Australia, p. 411, *coarctatus*, Sumatra, *longiceps*, New Caledonia, p. 412, *brachyxyphus*, p. 413, *pallidus*, p. 414, *gracilis*, p. 415, E. Asia, &c., *insulanus*, Borneo, p. 416, *breviceps*, Ceylon, E. India, *macroxyphus*, Cayenne, *madagassus*, p. 417, *lemur*, Madagascar, *conspersus*, p. 418, *spiniger*, *viridis*, p. 419, *kraussi*, *proximus*, p. 420, Brazil, *laticeps*, Bogota, *fuscipes*, E. India, p. 421, *punctipes*, St. Vincent, p. 422, *brunneri*, S. America, *prasinus*, Mexico, *surinamensis*, Antilles, &c., p. 423, *carbonarius*, Cuba, *dubius*, Japan, p. 424, *brevipennis*, E. India, *bolivari*, Buenos Ayres, *longipennis*, Zanzibar, p. 425, *albidonervis*, Madagascar, *vaginalis*, Australia, p. 426, *fuscinervis*, Cuba, p. 427, REDTENBACHER, Verh. z.-b. Wien, xli, n. spp.

*Copiophora cochleata*, Panama, p. 341, *brevicornis*, Peru, Antilles, p. 343, *coronata*, Amazons, p. 344, REDTENBACHER, Verh. z.-b. Wien, xli, n. spp.

✓ *Coptaspis*, n. g., *Conocephalides*, p. 456, for *C. crassinervosa*, New Caledonia, *brevipennis*, Australia, n. spp., p. 457 ; REDTENBACHER, Verh. z.-b. Wien, xli.

✓ *Coryphodes*, n. g., *Conocephalides*, p. 375, for *C. acuta*, n. sp., Bolivia, p. 376, pl. iii, fig. 24 ; REDTENBACHER, Verh. z.-b. Wien, xli.

*Cosmozoma sikoræ*, Madagascar, p. 121, *voluptaria*, Nossi-Bé, p. 122, BRUNNER, Verh. z.-b. Wien, xli, n. spp.

*Ctenophlebia styliformis*, *altera*, *longicerata*, p. 154, *granulosa*, *curvicercata*, Upp. Amazons, *fruhstorferi*, Brazil, p. 155, *rhombifolia*, Peru, p. 156, BRUNNER, Verh. z.-b. Wien, xli, n. spp.

*Cymatomera argillata*, Congo, KARSCH, p. 98, pl. iii, fig. 10, B. E. Z. xxxvi, n. sp.

✓ *Dædalus*, n. g., *Conocephalides*, for *D. apterus*, n. sp., Venezuela, pl. iii, fig. 3 ; REDTENBACHER, p. 338, Verh. z.-b. Wien, xli.

*Dectes spinosus*, oviposition ; WEED, Am. Nat. xxv, p. 294.

*Deinacrida maori*, New Zealand, PICTET & SAUSSURE, p. 296, pl., fig. 2, MT. Schw. ent. Ges. viii, n. sp.

*Diastella flexuoso-cercata*, New Guinea, BRUNNER, p. 98, Verh. z.-b. Wien, xli, n. sp.

✓*Dicranacrus*, n. g., *Conocephalides*, for *D. furcifer*, p. 489, *piceus*, *variegatus*, p. 490, n. spp., Madagascar; REDTENBACHER, Verh. z.-b. Wien, xli.

✓*Dicranocercus*, n. g., *Conocephalides*, p. 467, for *D. niger*, n. sp., Jolo, p. 468; REDTENBACHER, Verh. z.-b. Wien, xli.

✓*Dorycoryphus*, n. g., *Conocephalides*, for *D. longirostris*, n. sp., Brazil, pl. iii, fig. 23; REDTENBACHER, p. 375, Verh. z.-b. Wien, xli.

*Ducetia cruciata*, Cambodia, BRUNNER, p. 53, Verh. z.-b. Wien, xli, n. sp.

*Elbenia modesta*, Philippines, BRUNNER, p. 78, Verh. z.-b. Wien, xli, n. sp.

*Elimæa inversa*, Celebes, *minor*, Java, p. 48, *longicercata*, Borneo, *roseoalata*, Sumatra, p. 49, *curvicercata*, Java, p. 50, BRUNNER, Verh. z.-b. Wien, xli, n. spp.

✓*Eucalypta*, n. g., *Conocephalides*, for *E. cucullata*, n. sp., Madagascar; REDTENBACHER, p. 465, Verh. z.-b. Wien, xli.

*Eremus longicauda*, Malabar, PICTET & SAUSSURE, p. 317, pl., fig. 17, MT. Schw. ent. Ges. viii, n. sp.

*Eriolus spiniger*, Cayenne, p. 349, *longipennis*, Costa Rica, *frater*, Amer. ?, p. 350, *brevipennis*, Guatemala, p. 351, REDTENBACHER, Verh. z.-b. Wien, xli, n. spp.

✓*Eschatoceras*, n. g., *Conocephalides*, p. 448, for *E. dorsatus*, p. 450, *punctifrons*, *virescens*, p. 451, Upp. Amazons, n. spp., and including *Agræcia nigrovittata*, Bol., and *spinifrons*, de Geer; REDTENBACHER, Verh. z.-b. Wien, xli.

*Eucatopta heringi*, Karsch, description and figure; BRUNNER, p. 109, pl. ii, fig. 18, Verh. z.-b. Wien, xli.

*Eugaster woodii*, Somaliland, KIRBY, Ent. M. M. (2) ii, p. 211; *E. powysi*, Morocco, p. 294, *lucasi* (= *guyoni*, var., Luc.), Tunis, p. 295, KIRBY, Ent. M. M. (2) ii, n. spp.

✓*Eumegalodon*, n. n., to replace *Megalodon*, Brullé; BRONGNIART, p. clxxvi, Bull. Soc. Ent. Fr. 1891.

*Eurycorypha æquatorialis*, Rolas I., KRAUSS, p. 663, pl. xlv, fig. 9, Zool. Jahrb. v, Abth. Syst.; *E. voria*, Kilimandjaro, BRUNNER, p. 136, Verh. z.-b. Wien, xli : n. spp.

✓*Eurymetopa*, n. g., *Conocephalides*, for *E. obesa*, n. sp., Peru, pl. iii, fig. 11; REDTENBACHER, p. 354, Verh. z.-b. Wien, xli.

*Exocephala viridis*, Santarem, p. 347, *punctata*, Chiriqui, p. 348, REDTENBACHER, Verh. z.-b. Wien, xli, n. spp.

*Exora dohrni*, Sumatra, BRUNNER, p. 52, Verh. z.-b. Wien, xli, n. sp.

✓*Gelotopoa*, n. g., *Phaneropterides*, p. 111, for *G. bicolor*, n. sp., Sierra Leone, p. 112, pl. ii, fig. 19; BRUNNER, Verh. z.-b. Wien, xli.

✓*Glaphyronotus*, n. g., *Conocephalides*, for *G. roseipennis*, n. sp., Australia; REDTENBACHER, p. 464, Verh. z.-b. Wien, xli.

*Grammadera hastata*, Cayenne, BRUNNER, p. 150, Verh. z.-b. Wien, xli, n. sp.

*Gryllacris fumigata*, de Haan, description and figure, p. 304, pl., fig. 7 ; PICTET & SAUSSURE, MT. Schw. ent. Ges. viii.

*G. atriceps*, p. 305, pl., fig. 8, *brahmia*, p. 306, fig. 9, E. India, *mutabilis*, p. 307, fig. 10, Java, *vaginalis*, E. India, p. 309, fig. 11, *fusciculata*, Malay Arch., p. 310, fig. 12, *latipennis*, Java, p. 311, fig. 13, *imbecilus*, E. India, p. 312, *macilentus*, Java, p. 313, fig. 14, *longipennis*, p. 314, fig. 15, *atricula*, p. 315, fig. 16, America, PICTET & SAUSSURE, MT. Schw. ent. Ges. viii, n. spp.

† *Gryllorhynchus*, n. g., *Conocephalides*, p. 351, for *G. acutipennis*, n. sp., Brazil, p. 352, pl. iii, fig. 9 ; REDTENBACHER, Verh. z.-b. Wien, xli.

† *Habra*, n. g., *Phaneropterides*, for *H. securifera*, n. sp., Borneo, pl. i, fig. 11 ; BRUNNER, p. 85, Verh. z.-b. Wien, xli.

*Habrocomes lanosus*, Sierra Leone, KARSCHE, p. 103, pl. iii, fig. 13, B. E. Z. xxxvi, n. sp.

*Hemisaga haistata*, habits ; DISTANT, p. xxi, P. E. Soc. 1891.

† *Hetaira*, n. g., for *H. smaragdina*, n. sp., Brazil, pl. ii, fig. 33 ; BRUNNER, p. 175, Verh. z.-b. Wien, xli.

*Hexacentrus pusillus*, Java, p. 548, *inflatus*, *dorsatus*, Gaboon, p. 549, *australis*, Fiji Is., *elegans*, p. 550, *major*, p. 551, E. India, REDTENBACHER, Verh. z.-b. Wien, xli, n. spp.

*Himerta marginata*, India, *marmorata*, p. 56, *pallida*, Ceylon, *odontureformis*, E. India, p. 57, BRUNNER, Verh. z.-b. Wien, xli, n. spp.

*Holochlora marginata*, hab. ? , p. 91, *pratermissa*, Ceylon, *signata*, Borneo, *fuscospinosa*, Luzon, p. 92, BRUNNER, Verh. z.-b. Wien, xli, n. spp.

† *Homotoicha*, n. g., *Phaneropterides*, p. 124, for *H. diversa*, Sta. Catherina, *subdistincta*, Venezuela, *laminata*, Rio Grande do Sul, n. sp., p. 125, and including *Scudderia minor*, Br. ; BRUNNER, Verh. z.-b. Wien, xli.

*Hormilia peruviana*, Sarayacu, *latipennis*, Chiriqui, BRUNNER, p. 117, Verh. z.-b. Wien, xli, n. spp.

† *Hyperomerus*, n. g., *Conocephalides*, for *H. crassipes*, n. sp., Upp. Amazons, pl. iii, fig. 50 ; REDTENBACHER, p. 432, Verh. z.-b. Wien, xli.

*Hyperophora angustipennis*, Argentine Rep., *peruviana*, Peru, BRUNNER, p. 59, Verh. z.-b. Wien, xli, n. spp.

*Hyperphrona binotata*, p. 165, *cærulescens*, *gracilis*, p. 166, *atrosignata*, *punctulata*, p. 167, *sordida*, Upp. Amazons, *irregularis*, Chiriqui, p. 168, BRUNNER, Verh. z.-b. Wien, xli, n. spp.

† *Ischnophyllus*, n. g., *Conocephalides*, for *I. viridipennis*, n. sp., Ceylon, pl. iii, fig. 55 ; REDTENBACHER, p. 440, Verh. z.-b. Wien, xli.

*Isophya obtusa*, Syria, BRUNNER, p. 36, Verh. z.-b. Wien, xli, n. sp.

*Iosperu punctulata*, Ceylon, BRUNNER, p. 110, Verh. z.-b. Wien, xli, n. sp.

*Isotima javanica*, Java, BRUNNER, p. 54, Verh. z.-b. Wien, xli, n. sp.

*Karschia*, n. group of *Phaneropterides* for the following genus :

† *Karschia*, n. g., for *K. corrossa*, n. sp., Cameroons, pl. i, fig. 3, BRUNNER, p. 41, Verh. z.-b. Wien, xli.



*Lagárodes facetus*, Cameroons, KARSCH, p. 91, pl. ii, fig. 6, B. E. Z. xxxvi, n. sp.

*Leptodera flavipennis*, Ceylon, BRUNNER, p. 70, Verh. z.-b. Wien, xli, n. sp.

*Leptophyes angusticauda*, Kashmir, BRUNNER, p. 38, Verh. z.-b. Wien, xli, n. sp.

<sup>1</sup>*Liara*, n. g., *Conocephalides*, for *L. rufescens*, n. sp., Burma, pl. iii, fig. 57; REDTENBACHER, p. 444, Verh. z.-b. Wien, xli.

*Liocentrum aduncum*, W. Africa, KARSCH, p. 88, pl. ii, fig. 3, B. E. Z. xxxvi, n. sp.

<sup>1</sup>*Liostethus*, n. g., *Conocephalides*, for *L. gladius*, Brazil, p. 355, pl. iii, fig. 12, *pugio*, Brazil, p. 356, n. spp.; REDTENBACHER, Verh. z.-b. Wien, xli.

*Liotrachela lobata*, Mindanao, BRUNNER, p. 93, Verh. z.-b. Wien, xli, n. sp.

*Listroscelis atrata*, p. 545, *ferruginea*, Brazil, *arachnoides*, Colombia, p. 546, REDTENBACHER, Verh. z.-b. Wien, xli, n. sp.

<sup>4</sup>*Lobaspis*, n. g., *Conocephalides*, p. 458, for *L. bifasciata*, Australia, *cornuta*, Lord Howe's I., p. 459, *spuria*, *quadrituberculata*, p. 460, *tuberculata*, *falcata*, p. 461, Australia, *bimaculata*, Halmahera, *moluccana*, Amboyna, p. 462, REDTENBACHER, Verh. z.-b. Wien, xli, n. spp.

<sup>4</sup>*Loboscelis*, n. g., *Conocephalides*, p. 337, for *L. pilipes*, n. sp., Brazil, p. 338, pl. iii, fig. 2; REDTENBACHER, Verh. z.-b. Wien, xli.

<sup>4</sup>*Macedna*, n. g., *Phaneropterides*, p. 208, for *M. martini*, n. sp., Sumatra, p. 210, woodcut; KARSCH, B. E. Z. xxxvi.

<sup>4</sup>*Mastighapha*, n. g., *Prochilides*, p. 103, for *M. crassicornis*, n. sp., New Holland, p. 104, woodcut, p. 101; KARSCH, Ent. Nachr. xvii.

*Matæus longipennis*, *latipennis*, W. Africa, p. 84, *orientalis*, E. Africa, *acinaces*, Cameroons, p. 85, KARSCH, B. E. Z. xxxvi, n. spp.

*Mecopoda walkeri* (= *imperator*, Walk., nec Voll.), Philippines, *karschi*, Queensland, p. 407, *regina*, Duke of York I. p. 408, KIRBY, Tr. E. Soc. 1891, n. spp.

*Meroncidius transmarinus*, Rolas I., KRAUSS, p. 664, pl. xlv, fig. 10, Zool. Jahrb. v, Abth. Syst., n. sp.

*Microcentrum punctifrons*, Cayenne, *ligatum*, Columbia, p. 180, *erosum*, Upp. Amazons, p. 181, BRUNNER, Verh. z.-b. Wien, xli, n. spp.

*Morgenia hamuligera*, Karsch, description and figure; BRUNNER, p. 95, pl. i, fig. 14, Verh. z.-b. Wien, xli.

*Mormotus clavicercus*, *rastricercus*, pl. iv, fig. 17, W. Africa, KARSCH, p. 111, B. E. Z. xxxvi, n. spp.

*Mossula*, Wlk.: systematic position and characters noticed; KIRBY, p. 411, Tr. E. Soc. 1891.

*M. salomonis*, Solomon I., KIRBY, p. 411, Tr. E. Soc. 1891.

*Mustius afzelii*, redescribed, p. 81, figured, pl. ii, figs. 1 & 1a; KARSCH, B. E. Z. xxxvi.

<sup>1</sup>*Mygalopsis*, n. g., *Conocephalides*, p. 352, for *M. ferruginea*, n. sp., Australia, p. 353, pl. iii, fig. 10; REDTENBACHER, Verh. z.-b. Wien, xli.

† *Nannagræcia*, n. g., *Conocephalides*, for *N. gracilipes*, n. sp., Tapajos ; REDTENBACHER, p. 466, Verh. z.-b. Wien, xli.

† *Odontolakis*, n. g., *Conocephalides*, p. 480, for *Copiophora megacephala*, Burm., *C. sexpunctata*, Serv., and the following n. spp., *O. varia*, p. 481, *armata*, *hastata*, p. 482, *tibialis*, p. 484, *nigripes*, *virescens*, p. 485, Madagascar ; REDTENBACHER, Verh. z.-b. Wien, xli.

*Onosandrus puncticeps*, S. Africa, p. 297, pl., fig. 3, *femoratus*, E. India, p. 299, *maori*, New Zealand, p. 300, pl., fig. 4, PICTET & SAUSSURE, MT. Schw. ent. Ges. viii, n. spp.

*Opisthodictus cochlearistylus*, W. Africa, KARSCH, p. 87, pl. ii, fig. 4, B. E. Z. xxxvi, n. sp.

*Orchelimum silvaticum*, *volantum*, Illinois, McNEILL, Psyche, vi, p. 26 ; *O. gracile*, p. 70, *gladiator*, p. 71, Nebraska, BRUNER, Canad. Ent. xxiii : n, spp.

† *Oxylakis*, n. g., *Conocephalides*, for *O. punctipennis*, n. sp., Borneo, pl. iv, fig. 60 ; REDTENBACHER, p. 447, Verh. z.-b. Wien, xli.

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† *Oxystethus*, n. g., *Conocephalides*, for *O. intermedius*, Java, p. 441, *subapterus*, *lobatus*, Burma, p. 442, *brevipennis*, Java, *homœucanthus*, Cambodia, *heteracanthus*, Lower India, p. 443, n. spp. ; REDTENBACHER, Verh. z.-b. Wien, xli.

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*Pantecphyllus cerambycinus*, Cameroons, KARSCH, p. 100, pl. iii, fig. 11, B. E. Z. xxxvi, n. sp.

† *Paracædicia*, n. g., *Phaneropterides*, p. 101, for the following new species: *P. tibialis*, Key I., *raroramosa*, Halmahera, *obesa*, Waigiou, p. 102, *spinosa*, Aru I., *serrata*, p. 103, *planicollis* (hab. ?), *nigro-punctata*, New Guinea, *verrucosa*, Aru I., p. 104 ; BRUNNER, Verh. z.-b. Wien, xli.

*Parableta* (by error *Plagiopleura*) *soror*, Upp. Amazons, BRUNNER, p. 134, Verh. z.-b. Wien, xli, n. sp.

† *Paracosmophyllum*, n. g., *Phaneropterides*, for *P. atrodelineatum*, n. sp., pl. i, fig. 5, Madagascar ; BRUNNER, p. 61, Verh. z.-b. Wien, xli.

† *Parapyrrhicia*, n. g., *Phaneropterides*, for *P. zanzibarica*, pl. ii, fig. 28, n. sp., E. Africa ; BRUNNER, Verh. z.-b. Wien, xli.

† *Parascudderia*, n. g., *Phaneropterides*, p. 126, for *P. dohrni*, n. sp., Upp. Amazons, p. 127, pl. ii, fig. 24 ; BRUNNER, Verh. z.-b. Wien, xli.

*Paura*, Karsch, merged in *Isotima* ; BRUNNER, p. 54, Verh. z.-b. Wien, xli.

† *Pedinostethus*, n. g., *Conocephalides*, p. 361, for *P. exiguus*, n. sp., Madagascar, p. 362 ; REDTENBACHER, Verh. z.-b. Wien, xli.

† *Peropyrrhicia*, n. g., *Phaneropterides*, for *Dichopetala massaia*, de Borm. ; BRUNNER, Verh. z.-b. Wien, xli, p. 37.

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*Phaneroptera annulata*, Madagascar, BRUNNER, p. 107, Verh. z.-b. Wien, xli, n. sp.

✓ *Pharmacus*, n. g., *Stenopelmatidæ*, near *Pachyrhama*, p. 301, for *P. montanus*, n. sp., New Zealand, p. 302, pl., fig. 5 ; PICTET & SAUSSURE, MT. Schw. ent. Ges. viii.

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*Plagiopleura consobrina*, Upp. Amazons, BRUNNER, p. 133, Verh. z.-b. Wien, xli, n. sp.

*Plegmatoptera hoeckneli*, Kilimanjaro, BRUNNER, p. 44, pl. i, fig. 4, Verh. z.-b. Wien, xli, n. sp.

*Pæcilimon deplanatus*, I. of Cos, *pulcher*, Smyrna, p. 27, *inflatus*, p. 28, *pergamicus*, *syriacus*, *smyrnensis*, p. 29, Syria and Asia Minor, *thessalicus*, Greece, *bulgaricus*, Bulgaria p. 30, BRUNNER, Verh. z.-b. Wien, xli, n. spp.

*Pæcilogramma striatifemur*, Karsch, described and figured ; BRUNNER, p. 62, pl. i, fig. 6, Verh. z.-b. Wien, xli.

✓ *Polycleptis*, n. g., p. 105, *Prochilides*, for *P. scutellifera*, p. 106, woodcuts, p. 101, *inermis*, p. 107, n. spp., Chili ; KARSCH, Ent. Nachr. xvii.

*Polyglochis peculiaris*, Sierra Leone, KARSCH, p. 101, pl. iii, fig. 12, B. E. Z. xxxvi, n. sp.

*Posidippus lineatus*, p. 184, *dohrni*, p. 185, *rarospinulosus*, Upp. Amazons, *irregulariterdentatus*, Peru, p. 186, BRUNNER, Verh. z.-b. Wien, xli, n. spp.

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*Protina guttulata*, Br., description and figure ; BRUNNER, p. 98, pl. i, fig. 16, Verh. z.-b. Wien, xli.

✓ *Psacadonotus*, n. g., *Conocephalides*, for *P. seriatus*, pl. iii, fig. 58, *irregularis*, n. spp., West Australia ; REDTENBACHER, p. 445, Verh. z.-b. Wien, xli.

*Pseudophaneroptera major*, Sumatra, BRUNNER, Verh. z.-b. Wien, xli, n. sp.

✓ *Pseudopyrrhizia*, n. g., *Phaneropterides*, for *P. punctata*, n. sp., Zanzibar ; BRUNNER, p. 110, Verh. z.-b. Wien, xli.

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*Psyra ceylonica*, Ceylon, p. 87, *longestylata*, Philippines, *longelaminata*, Borneo, p. 88, BRUNNER, Verh. z.-b. Wien, xli, n. spp.

*Pyrgocorypha velutina*, E. India, REDTENBACHER, p. 374, Verh. z.-b. Wien, xli, n. sp.

† *Pyrgophylax*, n. g., *Phaneropterides*, for *P. ceylonicus*, n. sp., Ceylon, pl. i, fig. 10; BRUNNER, p. 73, Verh. z.-b. Wien, xli.

*Pyrrhiziu zanzibarica*, Zanzibar, BRUNNER, p. 55, Verh. z.-b. Wien, xli, n. sp.

*Rhaphidophora picea*, Serv., description and figure; PICTET & SAUSURE, p. 303, pl. fig. 6, MT. Schw. ent. Ges. viii.

† *Rhegmatopoda*, n. g., for *Horatosphaga leptocerca*, Stål; BRUNNER, p. 44, Verh. z.-b. Wien, xli.

† *Rhytidaspis*, n. g., *Oonocephalides*, p. 479, for *R. picta*, n. sp., New Guinea, p. 480; REDTENBACHER, Verh. z.-b. Wien, xli.

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*Scudderia*: position and composition amended; BRUNNER, p. 118, Verh. z.-b. Wien, xli.

† *Scytocera*, n. g., *Conocephalides*, for *S. longicornis*, n. sp., Philippines, pl. iii, fig. 52; REDTENBACHER, p. 436, Verh. z.-b. Wien, xli.

† *Simodera*, n. g., *Prochilides*, p. 102, for *S. halteratu*, n. sp., Madagascar, p. 103, woodcut, p. 101; KARSCH, Ent. Nachr. xvii.

*Stenampyx annulicornis*, Cameroons, KARSCH, p. 93, pl. iii, fig. 7, B. E. Z. xxxvi, n. sp.

*Subria amazonica*, Upp. Amazons, p. 434, *concolor*, Amboyna, *sulcata*, pl. iii, fig. 51, S.E. Asia, p. 435, REDTENBACHER, Verh. z.-b. Wien, n. spp.

*Tapeina cucullata*, *truncata*, Sumatra, BRUNNER, p. 74, Verh. z.-b. Wien, xli, n. spp.

† *Teratura*, n. g., *Conocephalides*, for *T. monstrosa*, n. sp., Burma, REDTENBACHER, p. 492, Verh. z.-b. Wien, xli.

*Tetraconcha scalaris*, *smaragdina*, W. Africa, BRUNNER, p. 116, Verh. z.-b. Wien, xli, n. spp.

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† *Theia*, n. g., *Phaneropterides*, for *T. lineata*, Upp. Amazons, p. 174, *unicolor*, Brazil, p. 175, pl. ii, fig. 32, n. spp., BRUNNER, Verh. z.-b. Wien, xli.

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*Tomias stenopterus*, Cameroons, KARSCH, p. 90, pl. ii, fig. 5, B. E. Z. xxxvi, n. sp.

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*Tylopsis marginata*, Port Natal, BRUNNER, p. 113, Verh. z.-b. Wien, xli, n. sp.

*Tympanocompus*, n. g., *Pseudophyllides*, p. 107, for *T. acclivis*, n. sp., Cameroons, p. 108, pl. iv, fig. 16; KARSCH, B. E. Z. xxxvi.

*Udeopsylla compacta*, Nebraska, BRUNER, p. 38, Canad. Ent. xxiii, n. sp.

*Vossia*, n. g., *Phaneropterides*, p. 139, for *V. obesa*, n. sp., Cameroons, pl. ii, fig. 27, p. 140, BRUNNER, Verh. z.-b. Wien, xli.

*Weissenbornia præstantissima*, Karsch, figured, pl. i, fig. 9; BRUNNER, Verh. z.-b. Wien, xli.

*Xenica*, n. g., *Phaneropterides*, p. 39, for *X. dohrni*, *superba*, pl. i, fig. 2, Brazil, n. spp., p. 40; BRUNNER, Verh. z.-b. Wien, xli.

*Xestophrys*, n. g., *Conocephalides*, for *X. javanicus*, n. sp., Java, pl. iii, fig. 16; REDTENBACHER, p. 362, Verh. z.-b. Wien, xli.

*Xiphidiopsis*, n. g., *Conocephalides*, p. 531, for *X. citrina*, E. India, *capreola*, *fallax*, p. 532, *distincta*, p. 533, Java, n. spp.; REDTENBACHER, Verh. z.-b. Wien, xli.

*Xiphidium modestum*, p. 56, *attenuatum* (Scud.), p. 57, *nigropleurum*, p. 58, Kansas, BRUNER, Canad. Ent. xxiii; *X. (Orchelimum) robustum*, New Orleans, p. 499, *inermis*, Texas, p. 501, *nitidum*, Georgia, *spinulosum*, North Carolina, p. 503, *laticauda*, New Orleans, p. 504, *X. (Xiphidium* s.str.) *longipes*, S. America, p. 505, *versicolor*, Upp. Amazons, p. 507, *chinense*, Amur, p. 509, *flavum*, Celebes, *nigro-geniculatum*, Borneo, p. 511, *infumatum*, Mioko, p. 512, *longicorne*, Java, &c., *vittatum*, Aru Is., New Zealand, *affine*, Philippines, p. 513, *gladiatum*, Japan, *borneense*, Borneo, *lætum*, N. Australia, p. 514, *aberrans*, Rio Grande do Sul, p. 516, *bituberculatum*, Australia, p. 517, *lugubre*, Egypt, *guineense*, W. Africa, p. 518, *natalense*, Natal, p. 519, *tæniatum*, Texas, p. 520, *truncatum*, Brazil, *curtipenne*, Missouri, *propinquum*, Centr. America and Antilles, p. 522, *brachypterum*, Venezuela, p. 523, *angustifrons*, Colombia, p. 524, *japonicum*, Japan, p. 525, *javanicum*, Java, *latifrons*, Australia, p. 526, *geniculare*, Moluccas and New Zealand, *cognatum*, Borneo, p. 527, *pictum*, E. India, *signatum*, *trifasciatum*, Ceylon, p. 528, *vestitum*, Philippines, *adustum*, Amboyna, p. 529, *formosum*, Java, *carbonarium*, W. Africa, p. 530, REDTENBACHER, Verh. z.-b. Wien, xli : n. spp.

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Notes on the injurious locusts of N. America; RILEY (722), and BRUNER, Ins. Life, iv, pp. 18, &c.

. Destructive *Acridiidae* in India; COTES, Ind. Mus. Notes, ii, pp. 99–115.

. *Acridium peregrinum*, metamorphosis and colour variation; BRONGNIART, C.R. cxiii, pp. 403–405 : metamorphoses, &c.; *id.* Le Nat. 1891, pp. 217, &c.: in S. Algeria, and its use as food; KÜNCKEL, C.R. cxii, p. 307 : habits in Algeria; BRONGNIART, *t. c.* p. 1318 : variation, &c., in Algeria; KÜNCKEL, p. xxv, Bull. Soc. Ent. Fr. 1891 : in India, with plate of metamorphoses; COTES, J. Bomb. N. H. Soc. vi, pp. 242, &c.

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*Stauronotus maroccanus* in Algeria ; BRUNNER, p. 82, Verh. z.-b. Wien, xli.

*Stenobothrus rufipes*, courtship and music ; LESNE, p. cxxv, Bull. Soc. Ent. Fr. 1891.

*Stenocrobilus festivus*, Cameroons, KARSCH, p. 190, B. E. Z. xxxvi, n. sp.

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# ECHINODERMATA.

BY

E. A. MINCHIN, B.A.

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## INTRODUCTION.

THE number of titles (186) in the Echinoderm literature for 1891 is exceptionally large, and the year is no less remarkable for the number of important additions to our knowledge of the group which have been brought forward.

In Morphology, LUDWIG (1) discusses the anatomy of *Ankyroderma*, and LUDWIG & BARTHELS give a preliminary account of the results of their investigations on the *Synaptidæ*. PERRIER (1) concludes his elaborate memoir on the organization of *Antedon*. Important statements bearing on the morphology of fossil Crinoids will be found under BATHER (1, 2, 5), JAEKEL (1, 2), and WACHSMUTH & SPRINGER. PERRIER (4) obtains important results from a study of the young of *Asterias spirabilis*, and their mode of attachment to the mother. DURHAM has a new explanation of the homologies of the ovoid gland and axial sinus, for which see also PERRIER (4) and CUÉNOT (1). CARPENTER leaves us a valuable memoir on the morphology of *Cystidea*. Finally, CUÉNOT (1) publishes his views on Echinoderm morphology in a prolix paper, containing comparatively little original observation.

The most important embryological papers of the year are those of LUDWIG (3, 4) on the development of *Cucumaria*. BROOKS & FIELD have valuable observations on the larval development of *Asterias*. RUSSO (2, 3, 5, 6) has a number of papers on the development of *Amphiura squamata*. The interesting observations of FOL on the fertilization of the ovum of *Asterias* are of far-reaching significance. DRIESCH and FIEDLER have experimental observations on the segmentation of the ovum in Echinoderms, and PICTET studies with great care the spermatogenesis of various Echinoids. Of considerable interest are the observations of CHADWICK on reproduction by Fission in *Cucumaria*.

The Phylogeny of Echinoderms is discussed by BELL (5), CUÉNOT (1), and NEVIANI, and that of Holothurians by LUDWIG (1).

Under Physiology, the most important observations are those of DEMOOR & CHAPEAUX on the nervous system, and DURHAM on the wandering cells and their excretory functions. LOEB & CUÉNOT (1) should also be specially cited. Protozoan parasites of Echinoderms are described by CUÉNOT (5), and MINGAZZINI.

In the Systematic Literature, the striking feature of the year is the large number of works on fossil Echinoids; see especially CLARK, COTTEAU (1, 3, 4, 5, 6), GREGORY (1, 2, 3, 4), DE LORIOI (3), SEUNES & TATE, and HOYLE for British living Echinoids. Crinoids also are well represented: for fossil forms, see BATHIER (1, 2, 5), DE LORIOI (3), MILLER (1, 3), MILLER and GURLEY, JAEKEL (2), and ROWLEY (1, 4, 5); for living species see HARTLAUB & CARPENTER (4). SLADEN (2) has an important memoir on fossil Asterids, and BELL (3, 8) and PERRIER (4, 5) on recent forms. WALSH describes numerous Holothurians. More general systematic works are SLADEN (1), and DE LORIOI (2).

Finally, attention should be drawn to the progress of LUDWIG'S (5) most valuable account of *Echinodermata*, in which the Holothurians are now completed, and also to PERRIER'S (3) account of the group in his Treatise on Zoology.

### I.—LIST OF PUBLICATIONS.\*

AGASSIZ, A. *Calamocrinus diomedæ*. J. R. Micr. Soc. 1891, pt. ii, p. 202. Abstract of the paper published in Bull. Mus. C. Z. xx, No. 6, pp. 165–167. [*Vide* Zool. Rec. 1890.]

ALCOCK, A. [See WOOD-MASON & ALCOCK (1, 2).]

AMI, H. M. (1) List of Fossils from Ottawa and Vicinity. Tr. Ottawa Nat. Club, ii, No. 1 (1884) pp. 54–62. [*Crinoids* and *Cystids*.]

——. (2) On the Geology of Quebec and Environs. Bull. Geol. Soc. Am. ii, pp. 477–502, pl. xx. [2 *Crinoids*, *vide* p. 85, *infra*.]

BAILEY, G. The Tenants of a Fossil *Echinus*. P. Tr. Croydon Nat. Hist. Club, 1891, pp. 253–256.

Describes *Foraminifera*, *Diatoms*, &c., found inside the shell of a *Micraster* from the chalk.

BARTHELS, P. [See LUDWIG & BARTHELS.]

BATHIER, F. A. (1) British Fossil Crinoids. IV. *Thenarocrinus gracilis*, n. sp., Wenlock Limestone; and Note on *T. callipygus*. Ann. N. H. (6) vii (Jan., 1891), pp. 35–40, pl. i.

The new species appears to connect *Thenarocrinus* with the *Dendrocrinites*: the type specimen presents some interesting abnormalities.

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\* An asterisk prefixed to a quotation indicates that the Recorder has not seen the Journal or Work referred to.

[BATHER, F. A.] (2) British Fossil Crinoids. v. *Botryocrinus*, Wenlock Limestone. *Op. cit.* (May, 1891) pp. 389-413, pl. xiii.

— (3) "*Goldfussia*," "*Comaster*," and "*Comatulidæ*." *T. c. p.* 464. *Goldfussia* [NORMAN (1)] preoccupied.

— (4) Some alleged cases of Misrepresentation. *Op. cit.* (June, 1891) pp. 480-489.

The author defends his representation of Wachsmuth & Springer's writings on the anal plates of the *Inadunata* (Brit. Foss. Crin. ii, Zool. Rec. for 1890), and brings against them counter-charges of inaccuracy.

— (5) On some specimens of *Herpetocrinus fletcheri*, from Dudley. P. Geol. Soc. London, 1891, p. 5.

— (6) Philip Herbert Carpenter. *Geol. Mag. (n.s.)* Dec. iii, viii, (Dec., 1891), pp. 573-575.

An obituary notice, with a supplementary bibliography.

— [See also HOLM (1, 2) and WACHSMUTH & SPRINGER.]

BEACHLER, C. S. The Rocks at St. Paul, Indiana, and Vicinity. *Am. Geol.* vii, pp. 178 & 179.

BELL, A. Notes upon the Marine Accumulations in Largo Bay, Fife, and at Portrush, County Antrim, North Ireland. *P. Phys. Soc. Edinb.* x (2) 1891, pp. 290-297. [*Echinoids.*]

BELL, F. JEFFREY. (1) Stray Notes on the Nomenclature, &c., of some British Starfishes. *Ann. N. H. (6)* vii, No. 39, pp. 233-235.

Discusses the names (1) *Hippasterias phrygiana*; (2) *Palmipes*; (3) *Porania pulvillus*; (4) *Cœlasterius*; (5) *Lophaster furcifer*; and (6) *Marginaster*, and mentions the presence of some rare forms on the E. coast: *Anseropoda placenta* from Aberdeen, *Porania pulvillus* from Ross-shire.

— (2) A Note on Canon Norman's Remarks. *Op. cit.* No. 41, p. 465.

Replies to the remarks of NORMAN (1).

— (3) *Asterias rubens* and the British Species allied thereto. *Op. cit.* No. 42, pp. 469-479, pls. xiv & xv. Abstract in *J. R. Micr. Soc.* 1891, pt. iv, p. 479.

— (4) A Test Case for the Law of Priority. *Ann. N. H. (6)* viii, No. 43, pp. 108 & 109.

Discusses the use of the word *Holothuria*.

— (5) On the arrangement and inter-relations of the classes of the *Echinodermata*. *Ann. N. H.* viii (1891) pp. 206-215. Abstract in *J. R. Micr. Soc.* 1891, pt. v, pp. 602-604.

— (6) Some Notes on British Ophiurids. *Ann. N. H. (6)* viii, No. 46, pp. 337-344.

— (7) Ad historiam *Cucumariæ*. *Op. cit.* No. 47, p. 40.

Discusses (1) *Cucumaria* versus *Pentacta*; (2) the meaning of the term "*Le fleurilardé*," as applied by Dicquemare to *Cucumaria pentactes*.

[BELL, F. JEFFREY.] (8) Observations on a rare Starfish, *Bathybiaster vexillifer*. P. Z. S. 1891, pt. ii, pp. 228-231, pls. xxiii & xxiv. Abstract in J. R. Micr. Soc. 1891, pt. v, p. 606.

BERGERON, J. Étude géologique du Massif Ancien situé au sud du plateau central. Ann. Sci. Géol. xxii, 1889, iv & 362 pp., 9 pls. and map. A new *Cystid* described by MUNIER-CHALMAS and the author.

LO BIANCO, S. Metodos usados en la Estación Zoológica de Napoles para la Conservacion de los Animales Marinos. An. Soc. Esp. xx, pp. 273-322.

Translation by D. MANUEL CAZURRO of the Mémoir by Lo Bianco in MT. z. Stat. Neap. (*Vide* Zool. Rec. 1890.) Translated into French in Bull. Soc. Fr. Belg. xxiii, pp. 100, *et seq.*, and by P. GROULT in Le Nat. (2) v (1891), p. 173 (Echinoderms), accompanied by figures of *Asterias*, *Brisinga*, *Ophiothrix*, *Holothuria* (*Dendrochirote*!), *Cucumaria*, and *Synapta*.

BILLINGS, W. R. (1) Notes on two Species and one Genus of Fossils from the Trenton Limestone, Ottawa. Tr. Ottawa Nat. Club, i, No. 2, 1880-81 (1881), pp. 34 & 35. [*Cystids* and *Crinoid*.]

— (2) Two New Species of *Crinoids*. *Op. cit.* ii, No. 2, 1884-85 (1885), pp. 248-250, pl.

— (3) Notes on, and Descriptions of, some Fossils from the Trenton Limestone. *Op. cit.* i, No. 4, 1882-83 (1883) pp. 49-52, pl.

— (4) A New Genus and three New Species of *Crinoids* from the Trenton Formation, with notes on a large specimen of *Dendrocrinus proboscidiatus*. *T. c.* No. 4 (1887) pp. 49-54, pl.

These papers have not been recorded previously.

BITTNER, A. Ueber *Parabrissus* und einige andere alttertiäre Echiniden-Gattungen. Verh. geol. Reichsanst. 1891, No. 6, pp. 133-144.

BLANCKENHORN, —. Das Marine Miocän in Syrien. Denk. Ak. Wien, lvii (1890) pp. 591-620, 4 woodcuts. [*Echinoids*.]

BÖHM, J. Kreidebildungen des Fürbergs und Sulzbergs bei Siegsdorf in Oberbayern. Palæontogr. xxxviii, lief 1 & 2, pp. 1-106, taf. i-v. Several *Echinoids*, 1 new *Ophiurid*, and 2 *Crinoids*.

BORNEMANN, J. G. Die Versteinerungen des cambrischen Schichtensystems der Insel Sardinien. Zweite Abtheilung und Nachträge zur ersten Abtheilung. N. Acta Ac. L.-C. Nat. cur. lvi, pp. 425-508, taf. xix-xxviii. [*Echinoderms*, p. (8) 433.]

BRONN, —. [Klassen und Ordnungen—*Echinodermata*. See LUDWIG, H.]

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- Echinoderm fauna of Bergen, p. 30.
- BUTTS, E. A Description of a New Species of *Echinodermata* from the Upper Coal Measures of Kansas City. Kansas Nat. iv (Oct. 1890), No. 11 p. 1. [*Crinoid*, vide p. 81, *infra*.]
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- (2) Notes on some Arctic *Comatulæ*. T. c. pp. 53-63, pl. ii.
- (3) Notes on some *Crinoids* from the Neighbourhood of Madeira. T. c. pp. 64-69.
- (4) Preliminary Report on the *Crinoidea* obtained in the Port Phillip Biological Survey. P. R. Soc. Vict. (n.s.) ii (June, 1890), pp. 135 & 136. Abstract in J. R. Micr. Soc. 1891, i, p. 51.
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- CHAPEAUX, M. [See DEMOOR & CHAPEAUX.]
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- COTTEAU, G. (1) Échinides Éocènes de la Province d'Alicante. Mém. Soc. Géol. (3) v, pt. ii. 1st fasc. 1890, 2nd fasc. 1891, 104 pp., 16 pls.
- (2) Note sur le *Echinolampas*. C.R. Ass. Fr. Sci. xix (1890) pp. 337-341.
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| Liv. 18, Nov. 1889, | pp. 1-48,  | pls. cci-ccxii.      |
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- List of *Crinoidea*, p. 69.
- CUÉNOT, L. (1) Études morphologiques sur les Echinodermes. Arch. Biol. xi, fasc. iii & iv, pp. 313-680, pls. xxiv-xxxi. Abstract in J. R. Micr. Soc. 1891, pt. 6, pp. 746-748.
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- Abstract of the paper by the same author in the C.R. cxi, No. 22, p. 836. [*Vide* Zool. Rec. 1890.]
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- List of fossils, with various *Cidaris* remains, 1 *Crinoid* (*Pentacrinus subteroides*, Quenst.) fragment.

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1 *Echinoid*, *Cyphosoma aquitanicum*, Cott., p. 123.

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Describes methods of collecting, and gives short diagnoses with figures of the genera of Echinoderms occurring on the New England coast. Notice and criticism in Am. Nat. xxv, No. 299, pp. 995 & 996.

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FOWLER, G. H. Hermit Crabs and Anemones, &c. J. Mar. Biol. Ass. (n.s.) ii, pt. 1, pp. 75 & 76.

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- . (2) On the Keokuk Beds at Keokuk, Iowa. Am. J. Sci. (3) xl (1890) pp. 295-300.
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- . (2) Monographie de la Faune Eocénique de l'Alabama. 2<sup>e</sup> Partie. Annales de Géologie et de Paléontologie, 8th Livraison. Palermo: April, 1890, pp. 157-316, pls. xviii-xlvi. [*Echinoids*.]
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PERRIER, E. (1) Mémoire sur l'Organisation et le Développement de la Comatule de la Méditerranée (*Antedon rosacea*, Linck.) Suite et fin. Troisième parti. Organisation de l'*Antedon* adulte. N. Arch. Mus. (3) ii (1890), pp. 1-86, pls. i & ii.

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1 Crinoid, *Extracrinus subangularis*, Miller.

SPRINGER, F. [See WACHSMUTH & SPRINGER.]

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WALCOTT, C. D. (1) The value of the term "Hudson River Group," in Geologic Nomenclature. Bull. Geol. Soc. Am. i (April, 1890) pp. 335-356.

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WARDINGLEY, O. The Carboniferous Limestone of Scotland. Sci. Goss. No. 315 (March, 1891), pp. 60-64.

List of fossils, with a few *Crinoids* (wrongly named) and *Archæocidaris urii*.

WHITEAVES, J. F. The Fossils of the Devonian Rocks of the Mackenzie River Basin. Geol. and Nat. Hist. Survey of Canada. Contributions to Canadian Palæontology, vol. i, pt. iii, No. 5 (Montreal, May, 1891), pp. 197-253, pls. xxvii-xxxii. [New *Crinoid*.]

WOOD-MASON, J., & ALCOCK, A. (1) Natural History Notes from H.M. Indian Marine Survey Steamer 'Investigator,' Commander R. F. Hoskyn, R.N., Commanding. No. 21. Ann. N. H. (6) vii, pp. 1-19, 186-202, & 258-272.

*Echinodermata*, pp. 12-15.

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Echinoderms, pp. 427-443, fig. 11, and pl. xvii.

## II.—ANATOMY, HISTOLOGY, MORPHOLOGY, AND PHYLOGENY.

BATHER (2) describes peculiar covering-plates in the arm of *Botryocrinus ramosissimus*: "a large number of small irregular plates, which appear to extend beyond the limits of the groove itself over the adjacent portions of the arm-ossicles." The author controverts the statement of Lovén, Trautschold, and Wachsmuth, that slit-like fissures are present in the ventral sac (anal tube) of *Botryocrinus*. The columnals are divided by radial sutures into pentameres, which at the distal end of the stem have an hexagonal outline and an alternate arrangement.

The author shows that the species of the genus form an evolutionary series, in which the characters that differentiate the species represent stages of individual growth. This series is shown to exemplify the origin of pinnulate from simply dichotomous arms.

Under *B. pinnulatus* is described abnormal secondary arm-branching [cf. BATESON, Zool. Rec. 1890].

BELL (5) discusses the relations of the classes of *Echinoderms* to one another. The *Holothurians* are believed to be the most primitive, on the following grounds: (1) they are without a calyx ("non-calliculate"); (2) the genital apparatus is bilaterally symmetrical ("anactinogonidial"); (3) the body musculature is well developed; (4) in *Synaptids* there are ciliated funnels, and (5) in other *Holothurians* respiratory trees, both of which structures, the author suggests, are the remnants of a diffuse nephridial system; (6) the water-vascular system is always continued into

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circumoral tentacles, but not always into "podia" (tube-feet); (7) there is no ovoid gland; and (8) the larva and development is less complicated than in other classes. All other *Echinoderms* were calculate, but many *Cystidea* appear to have been anactinogonidial, and some *Cystids* were probably never fixed, and without fixed ancestors ("apelmatozoic"). The apelmatozoic actinogonidial *Cystids* lead, on the one hand, to the true pelmatozoic forms, in which the oral surface looks upward ("*Statozoa*"); on the other hand, to the *Echinoidea*, *Asteroidea*, and *Ophiuroidea*, in which the oral surface looks downwards ("*Eleutherozoa*"). The three latter classes should not be united under the common name *Echinozoa*. In *Echinoids* the ambulacra extend from the mouth to the calyx ("zygopodous"); in *Asteroids* and *Ophiuroids* the development of additional plates causes the ambulacra to be confined to the oral aspect of the body ("azygopodous"). The term brachiate should not be used, since the arms of a *Crinoid* are formed by addition to the free edge, and those of *Asteroids* and *Ophiuroids* by intercalation between the radial and terminal. The *Asteroids* and *Ophiuroids*, though descended from a common "*Stellerid*" ancestor, show very different types of organization. A phylogenetic tree is given, p. 211, and a classification of *Echinoderms* proposed (*vide* p. 46, Systematic), followed by concise definitions of the various groups.

CAMERANO describes sexual differences in *Strongylocentrotus lividus*. There are no constant differences in colour. The adult mature males are smaller than the females. They differ in shape, the females being slightly more flattened. There are no constant differences in the shape or arrangement of the skeletal plates or spines.

CARPENTER (1) discusses the following points in the morphology of *Cystidea*.—(1) The body-plates (pp. 1–17): many *Cystids* have a calycular system, which is essentially similar to that of *Crinoids*. (2) The summit openings (pp. 17–32): the opening in the centre of the ambulacra is the mouth. The six openings in the summit of *Juglandocrinus* were ambulacral in nature, and food particles entered through them on their way to the central mouth, just as they did at the arm-openings of the Camerata. The "hydrophores palmés" of Barrande are subtegmina ambulacra. The fourth opening of *Aristocystis* probably represented a water-pore, and was excretory in function. The third opening, situated in the anal interradius (C D), was a genital opening. In *Cystids*, in which no such third opening has been found, the genital ducts and rectum may have opened together below the valvular pyramid; just as in the family *Pterasteridae* the anus and oviducts open into a sort of marsupial pouch, and communicate with the exterior by the "oscular orifice" of Sladen. In *Agelacrinus* and *Caryocrinus* the third opening in the interradius (D E) was very probably nephridial; it perhaps represented a madreporite, and also placed the water vascular system in communication with the exterior, like the fourth opening of *Aristocystis* and Volborth's organ in *Glyptosphaera*. The third opening in the anal interradius of many forms may also have been

nephridial or madreporic rather than genital. (3) Some general considerations (pp. 32-43). The author believes that the basal and radial plates, and possibly also the dorsocentral, constitute a fundamental part of the organization of every *Echinoderm*, except perhaps *Holothurians*, and that the apical and oral systems of *Echinoderms* cannot be left out of consideration in any discussion respecting the phylogeny of the group. In a postscript (pp. 43-51) are discussed (1) the dorsocentral system; (2) the water vascular system and its relations; the view that the madreporic system is a left nephridium has much to be said for it; (3) the oscular orifice.

CUÉNOT (1) discusses at considerable length the morphology and phylogeny of the different classes of *Echinoderms*. For list of species studied see pp. 314 & 315; for technique, pp. 316-318. Orientation (pp. 330-336): the author considers the mouth or oral pole as the upper side, the aboral pole as the lower. The nomenclature of the radii proposed by Carpenter for *Crinoids* is adopted. Four planes of bilateral symmetry are recognized: (1) The *Holothurian* plane, passing through the stone-canal and dorsal mesentery; (2) the *Echinid* plane passing through the radius, B, interradius, D E; (3) the plane of Lovén, containing the anus in the *Echinoids*, in which it is eccentric, passing through the radius, D, interradius, A B; (4) the *Asteroid* plane, passing through the radius, E, interradius, B E. Teguments (pp. 336-351). Muscular tissue (pp. 337-339). Connective tissue (pp. 340 & 341). Calcareous tissue (pp. 341-347). Body-wall (pp. 347-351): In the young *Amphiura squamata* the ectoderm is distinct, but later becomes invaded by the mesoderm, so that it is impossible to distinguish between the two layers. Hence the ectoderm does not disappear as the result of friction, but becomes confounded with the mesoderm, and probably assists in the secretion of stereom. In *Cucumaria* the ectoderm cells are gathered into little separate masses imbedded in the connective tissue. Under each mass is a space filled by gelatinous ground substance, containing a large number of amibocytes; see pl. xxiv, fig. 4. Tegumentary appendages (351-369). Anchors of *Synapta* (pp. 352-354, pl. xxiv, fig. 6). Hooks of *Ophiuroids* (pp. 355 & 356). Radioles (pp. 356-365): (1) defensive and ambulatory radioles in *Echinoids*, *Crinoids* (*Arthroacantha*), *Ophiuroids*, and *Asteroids*; (2) vibratile radioles in *Asteroids* and *Clypeastroids*. Pedicellariæ (pp. 366-369). Cuvierian organs (pp. 369-374, pl. xxiv, fig. 19). Appendages of the body (pp. 383-386): i.e., the stem of *Crinoids* and the "aboral cone" of some *Asteroids*. Cœlome (pp. 386-397). *Synaptids* and *Holothurians* (pp. 386 & 387). *Crinoids* (p. 388). *Echinoids* (pp. 388-394): the small labial cavity of *Spatangoids* becomes greatly developed in *Gnathostomes*, forming a closed peripharyngeal space containing the masticatory apparatus; the external branchiæ and organs of Stewart are diverticula of the peripharyngeal space, which perhaps represents the schizocœlic space under the nerve, and not a portion of the cœlome. *Ophiuroids* (pp. 395 & 396). *Asteroids* (p. 396). The pericesophageal spaces existing in *Synaptids*, *Holothurians*, *Echinoids*, and *Ophiuroids*, are probably not homologous

spaces, since they owe their origin to different processes. Lining and vibratile organs of the coelome (pp. 397-404). *Synaptids* (398-401). The ciliated funnels are probably completely homologous with the urns of *Sipunculus*. In *Synapta inhaerens* enigmatic formations occur on certain parts of the wall of the coelome as little rounded papillæ filled with connective tissue placed radially round a central nodule, and covered with flat epithelium (pl. xxiv, fig. 13). *Holothurians* (p. 402). *Crinoids*: ciliated cups (p. 402). In *Echinoids* (p. 403), the coelomic fluid is kept in motion by globular organisms, with a long flagellum, floating in the liquid, and resembling spermatozoa. *Ophiuroids* (pp. 403 & 404). *Asteroids* (p. 404). Blood fluids (pp. 404-406). Digestive tract (pp. 407-416). *Holothurians* and *Synaptids* (p. 407). *Crinoids* (pp. 407 & 408). *Echinoids* (pp. 408-410). *Ophiuroids* and *Asteroids* (pp. 410 & 411). The blastopore only becomes the anus in *Holothurids* and *Synaptids*. In all others the digestive tract ends blindly for a certain period, a condition persisting in *Ophiuroids* and some *Asteroids*. The secondary anus is perforated independently in the different groups, as shown by the different positions occupied. Appendages of the digestive tract (pp. 410-413). Histology (p. 413). Organs of reserve (pp. 416-426). In *Synaptids* (p. 417), probably represented by modified amibocytes (pl. xxiv, fig. 15) found in various organs. In *Holothurians* (p. 418) reserves evidently contained in the numerous muriform amibocytes abundant in all the tissues. *Crinoids* (pp. 419-425). The sacculi probably represent reserve material, by means of which the animal can repair evisceration. Their structure and development is described (pl. xxiv, figs. 17 & 18). The yellow cells so abundant in the skin are looked upon as wandering amibocytes, carrying reserve products. *Echinoids* (p. 425). *Ophiuroids* and *Asteroids* (p. 426). Nervous system (pp. 445-458): it consists at its maximum of complication of three parts—(1) the epidermic nervous system, constant in all classes, innervating the skin, ambulacra, and digestive tract; (2) the internal nervous system, well developed in *Synaptids*, *Holothurians*, *Asteroids*, and *Ophiuroids*, much reduced in *Echinoids*, and wanting in *Crinoids*. It is probably of mesodermic origin, and innervates the motor muscles; (3) the enterocœlic nervous system, wanting in *Holothurians* and *Synaptids*, enormously developed in *Crinoids*. It is certainly of enterocœlic origin, and innervates muscles. Evolution of epidermic nervous system (pp. 446-448). Ectodermic cells of the nerve centres (pp. 449-452). Nervous system of *Asteroids* (pp. 452-458); of *Ophiuroids* (pp. 458-472); of *Echinoids* (pp. 472-479); of *Crinoids* (pp. 479-481); of *Holothurians* (pp. 482-484); of *Synaptids* (pp. 484-486). Phylogeny of nervous system (pp. 486-488). The nervous system was primitively superficial in all groups, and has migrated inwards independently in different forms: in *Echinoids* by invagination, in *Ophiuroids* by a kind of epibole, and in *Synaptids* and *Holothurians* by delamination. The separation of the nervous system into an epidermic and an internal layer appears to be produced secondarily, since the nerves they emit do not correspond in the different groups. The enterocœlic nervous system

was probably independently acquired in each group except *Holothurians*. Terminal tentacles (pp. 488-498). In *Cucumaria* the terminal tentacles resemble those of Urchins, and form a little circle round the anal aperture (pl. xxvii, fig. 41). In *Holothuria impatiens*, on the contrary, there are no terminal tentacles. In *Synaptids* there are no radial water vessels, but the nerve ends in contact with the epidermis (pl. xvii, fig. 40). Otocysts of *Synaptids* and *Elusipoda* (pp. 498-500). Sphæridia (pp. 501-517). Nerve Terminations in the skin (pp. 507-512). In *Synaptids* the skin contains numerous papillæ, composed of glandular cells arranged round a central group of filiform cells, in which a nerve terminates (pl. xxiv, fig. 5). Nerve Terminations in the Tentacles and Ambulacra (pp. 512-521). The sense-buds on the tentacles of *Synapta* are formed by an epithelial projection, at the tip of which is a small invagination of delicate cells bearing cilia (pl. xxvii, fig. 45). The papillæ on the ambulacral tentacles of *Antedon* contain elongated fusiform bodies, of doubtful significance, which stain strongly with saffranin, but are not nuclei (pl. xxvii, fig. 44). Visual Organs (pp. 521-523). Water-Vascular System (pp. 523-549). In *Synaptids* (pp. 523 & 524) no trace of radial canals [cf. LUDWIG (7) and BARTHELS *infra*]. *Holothurians* (pp. 524-529). *Crinoids* (pp. 529 & 530). *Echinoids* (pp. 530-536). *Ophiuroids* (pp. 536-540). *Asteroids* (pp. 540-542). Ambulacra and tentacles (pp. 542-549). Glandular appendages of the ambulacral ring (pp. 549-556). In *Synaptids* and *Holothurians* amibocytes are furnished by the Polian vesicle (pp. 549 & 550). In *Crinoids*, *Spatangoids*, and many *Clypeastroids*, the ambulacral ring has no glandular apparatus. In *Dorocidaris papillata* and *Peronella orbicularis* the ambulacral and lacunar rings are intimately connected, and the latter is glandular, and furnishes amibocytes to the water-vascular system by diapedesis. In *Echinodiscus biforis* the lacunar ring, instead of being glandular all round, has a certain number of spongy masses placed in the interradii. The ambulacral ring sends diverticula into each of these masses. In *Echinoids* there is a well-defined spongy mass in each interradius, the so-called Polian vesicles, for which the name "vesicules spongieuses" is proposed. In *Ophiuroids* Polian vesicles reappear (pp. 553 & 554). In *Asteroids* there are Tiedemann's bodies and Polian vesicles (pp. 554-556). Development and homology of the Madreporite (pp. 556-558): the plates which are perforated by the water-pore are not homologous in different groups. Multiplication of Water Tubes and Madreporites (pp. 559-562): in *Asteroids* and *Ophiuroids* a normal or abnormal increase in the radii usually corresponds with the presence of several stone canals. Species which multiply by division usually have several stone canals. Water-vascular System of *Ophiactis virens* (pp. 568-571). From the oral ring come off a number of canals in each interradius, which run towards the periphery of the disc and end cœcally. They perhaps replace physiologically the respiratory sacs, which are here wanting. Cavities of Irrigation (pp. 573-616): these comprise (1) cavities of schizocœlic origin, in relation with the nutrition of the nerve centres of the oral surface, present

in all *Echinoderms*; (2) cavities of enterocœlic origin, well-defined in *Echinoids*, *Ophiuroids*, and *Asteroids*; (3) the lacunar system well-developed in *Synaptids*, *Holothurians*, *Echinoids*, and *Crinoids*; rudimentary in *Asteroids* and *Ophiuroids*. It comprises an absorbing apparatus, collecting the products of digestion, and branches distributing them to the gonads, to certain glands, and to the radii. *Synaptids* (pp. 574 & 575). *Holothurians* (pp. 576-583). In *Cucumaria planci* the extremity of the dorsal marginal lacuna is transformed into a lymphatic gland. In *Holothuria impatiens* the whole oral lacunar ring is similarly transformed. The genital organs in *Holothuria impatiens* arise from a mass of cells (pl. xxx, fig. 76) which appear to be placed in the dorsal marginal lacuna of the intestine. *Crinoids* (p. 584): the oral lacunar ring is transformed into a lymphatic gland, for which the name "organe spongieux" is proposed. Enterocœlic cavities (*Echinoids*, *Asteroids*, and *Ophiuroids*) pp. 585-590. In these three groups, the enterocœlic vesicle, primitively interposed between the water-tube and the dorsal pore, stretches itself along the whole length of the water-tube, and becomes the axial sinus. The water-tube approaches the pore, but always retains a communication with the enterocœle. The ovoid gland appears as a differentiation in the axial sinus, arising in *Amphiura squamata* and *Asterias tenuispina* as a thickening of its inner wall. Development of Gonads in *Echinoids*, *Asteroids*, and *Ophiuroids* (pp. 590-598). In *Echinoids* the genital rachis grows from a thickening in the wall of the axial sinus. In *Asteroids* and *Ophiuroids* the genital rachis grows out from the ovoid gland. Schizocœlic cavities of *Echinoids*, *Asteroids*, and *Ophiuroids* (pp. 598-601). Lacuno-plastidogenous System (pp. 601-616). *Echinoids* (pp. 602-605). *Ophiuroids* (pp. 605-608). *Asteroids* (pp. 608-610). The lacunar systems of different classes are probably not homologous, their resemblances being due to convergence. The ovoid gland is perfectly homologous in *Echinoids*, *Asteroids*, and *Ophiuroids*, but the dorsal organ of *Crinoids* is probably not homologous with the ovoid gland, since it does not develop in connection with the enterocœle vesicle, and has not the lymphatic structure of the ovoid gland. In *Holothurians* there is also no homologue of the ovoid gland, since the enterocœlic vesicle becomes obliterated. The sexual cells originate in all cases from the cœlomic epithelium. Genital organs (pp. 616-629). Development of the ova (pp. 616-619). Development of the spermatozoa (pp. 619 & 620). Genital orifices (pp. 620-623). Hermaphroditism (pp. 623-629). Morphological value of Arms and Radii (pp. 631-635). Phylogeny (pp. 643-652). The author supposes a number of ancestral forms, for which the following names are proposed: (1) *Prosynapta*, ancestor of *Synaptids* (p. 643); (2) *Proholothuria*, ancestor of *Holothurians* (pp. 643 & 644); (3) *Procystus*, ancestor of *Pelmatozoa* (p. 644); (4) *Proechinus*, ancestor of *Echinoids* (pp. 644 & 645); (5) *Proaster*, ancestor of *Asteroids* and *Ophiuroids*. These ancestral forms are directly descended one from another in the above order, and at the same time each gives off lateral branches, which become the *Synaptids*, *Holothurians*, &c., the main stem being directly continued by the *Asteroids*.

The ancestor of *Synaptids* was without radial water-vascular canals, which have never been developed in the group. The author does not believe radial symmetry to have been acquired by fixation.

CUÉNOT (4) describes the blood and lymphatic organs of *Echinoids*, pp. 613-626, *Asteroids*, pp. 626-628, *Ophiuroids*, pp. 628-630, *Crinoids*, pp. 630-635, and *Holothurians*, pp. 635-641. A *résumé* and comparison of the results obtained in *Echinoderms* and other animals is given, pp. 641-656. Cf. CUÉNOT (1).

For a description of the nervous system of *Asterias rubens*, see DEMOOR & CHAPEAUX, pp. 112-117. The superficial epithelium is composed of sensory cells and supporting cells. The infraepithelial fibrillar plexus consists of nerve fibrils and ganglion cells, for the most part fusiform. There is a fibrillar zone under the peritoneal epithelium, which is believed to be connected with the epithelial nervous system by nerve fibrils.

DURHAM has studied, in *Asterias rubens* and some other *Echinoderms*, the histology of the dorsal organ (ovoid gland) and the so-called blood-vessels coming from it, for which he proposes the term "hæmal strands," distinguishing them as circumoral, radial, genital, and gastric. The whole "hæmal system" is contained in the perihæmal canals, and the dorsal organ in the axial perihæmal space.

The dorsal organ of *Asterias* contains—(1) fibres, possibly contractile, running longitudinally; the organ contracts when irritated by a needle; (2) large numbers of leucocytes, some containing granules, and some with pseudopodial processes projecting from the surface of the organ. The whole organ consists of a number of anastomosing hæmal strands.

In *Cribrella* (2mm. in diameter) there is a single water pore communicating with the axial sinus, into which also the free end of the water tube opens. The cavity of the axial sinus extends amongst the strands which form the dorsal organ, as "intercanalicular" spaces. In the dorsal organ of *Echinoids* there exist epithelium-lined spaces communicating together, and with a cavity extending longitudinally along the organ; this system of spaces has free communication with both the water pores and the water tube, though in certain forms only, not in *Echinids*. This space bears the same relations as, and is homologous with, the axial perihæmal sinus in *Asteroids*. The presence or absence of free communication with the water and madreporic tubes depends upon whether the embryonic condition has been retained or lost. If the axial sinus (left anterior enterocœle of Bury) be imagined to contract upon the enclosed organ and fuse with its surface, except along the stone canal, the condition is obtained which exists (Prouho) in *Dorocidaris*. The author does not favour Sarasin's nephridial theory of the dorsal organ, and looks upon S.'s nephrostomes in *Asthenosoma*, which he was unable to find in *Spatangus purpureus* and *Echinus sphaera*, as communications of the axial sinus with the celome.

For oögenesis and spermatogenesis of *Asterias vulgaris*, see FIELD.

GREGORY (3) believes that the fossil *Schizaster d'urbani* was viviparous. The author further explains supposed specific differences in specimens of *Temnechinus excavatus*, Forbes, and *Echinus henslovi*, Forbes, as instances of sexual dimorphism. [Cf. CAMERANO, *suprà*.]

JAEKEL (1) describes a completely preserved calyx covering of *Extracrinus fossilis*, Blumenb., sp. (= *Pentacrinus briareus*, Miller), from Lyme Regis. A comparison of it with living *Pentacrinids* showed it to be in no way abnormal. In the place where the anus should be, according to the analogy of living forms, there was to be seen a shallow pyramid, consisting of broad plates, few in number and tapering rapidly towards the tip, which carried lateral pegs, and on their outer side knobs. Thus the structure of the anal tube of this Liassic *Pentacrinid* shows a transition from the Palæozoic *Poteriocrinidæ* to the living forms. *Extracrinus fossilis* cannot, however, be looked upon as an ancestral form, on account of the remarkable development of its radialia prima.

The specimen also showed that the high vaulting of the calyx, usually supposed to be normal, results from lateral compression of the calyx covering. Similarly moveable calyx coverings were possessed by *Marsupiocrinus caelatus* and *Periechocrinus moniliformis*; also by *Ichthyocrinus*, which shows that a close union of *Ichthyocrinus* and *Crotalocrinus* is untenable.

JAEKEL (2) describes the external form, morphological structure, the microscopic structure, and phylogenetic relations of the *Holopocrinidæ* (better known as *Eugeniocrinidæ*). The term "patina" is suggested for the dorsal cup of articulate *Crinoids*. The patina is formed of a single circle of radial plates, usually five (exceptionally four) in number, the "costalia prima." The basalia are no longer present morphologically, but their primitive position is proved by the course of the axial canals (taf. xl, figs. 7 & 8); they are now overgrown by the radials. The term "costalia" is proposed in all cases where the radially placed pieces do not suddenly become brachialia. In *Holopocrinidæ*, the lower parts of the arms are attached by five articular surfaces to the patina and take part in limiting the body cavity, but carry no pinnulæ, and consist of costalia ii & iii, which are either united by syzygy or fused. The latter is an axillary piece. The radial articular facets are described in detail (with figs. 3 & 4 in the text). An external ligament tends to keep the arms unrolled, and is opposed by an internal muscle which rolls them up. The third costals, or the fused second and third, are shown to have been axillaria, and each to have supported two small arms: the text-book reconstructions of *Eugeniocrinus* are quite at fault. The simplest type occurs in *Cyrtocrinus nutans*. The stem shows variations in the number of columnals. The axial canal is in the middle, and is round in section. The root consists of a single irregular piece, from which usually several stems arise. Free ending of the stem is unknown. The minute structure of the calcareous pieces shows irregular meshes in the centre and very regular ones at the periphery, agreeing exactly with the description



given by Carpenter of *Holopus rangi*. The relations of *Holopus* to the *Larviformia* of Wachsmuth & Springer are discussed, and it is pointed out that *Holopus* differs from them: (1) in being unstalked; (2) in having arms that can be rolled up; (3) in having no basals; but it probably had both basals and infrabasals at an earlier period, and therefore is not truly monocyclic. There only remains the tegmen in which it resembles them, in which, however, it agrees also with *Hyocrinus* and *Thaumatoocrinus*. From a comparative consideration of the calyx-covering in *Crinoids*, it results that in all forms in which moveable portions of the arms take a part in limiting the body-cavity, the tegmen is also moveable, and covered with little plates or quite naked. In all *Crinoids* in which the body cavity lies in a firmly connected capsule, or true calyx, the tegmen is immoveable, and therefore readily contains larger plates, which, on account of the ambulacral vessels, are necessarily interradiar. Hence, all large plates in the centre of the tegmen are not necessarily homologous oral plates. *Holopus*, with its firm calyx, reverts to the older type and retains oral plates throughout life, as a persistence of embryonic peculiarities. From these reasons, *Holopus* cannot be retained in the *Larviformia*, and the structure of the calyx is no hindrance to placing it with the *Articulata*.

*Holopocrinidæ* differ from all *Articulata* in having no demonstrable basals. In *Encrinidæ* the basals are very rudimentary. In *Exocrinus* the basals are very much overgrown by the costalia, while in *Comatulidæ* this is carried to an extreme. In *Holopocrinidæ* the reduction of the basals was concluded in the Lias, while in *Comatulidæ* they still persist.

It is concluded that the *Holopocrinidæ* are a family of the *Articulata*, appearing in the Dogger and persisting to the present, the natural position of which is near the *Pentacrinidæ* and *Comatulidæ*.

JANET & CUËNOT enumerate a number of cases of *Echinoids* with multiple genital pores. In spite of the resemblance to *Palechinoids*, the authors do not look upon it as an atavistic condition, but as an abnormality. Whatever the number of pores may be, the genital gland remains simple.

The authors further discuss the extension of the madreporic pores outside the madreporite. *Echinocyamus pusillus* has only one pore. On the other hand, a specimen of *Arbacia punctulata* is described in which the pores extend half way down the test in the madreporic interradius; internally nothing was visible of these extra pores. The authors hold the opinion that the interradiar plates of the apical system are basals and the radial plates terminals.

LAMBERT (2) describes a specimen of *Echinocorys vulgaris*, in which the left posterior ambulacrum is placed further back than that of the right side, owing to the presence of a supplementary plate on the left side, which touches the fourth (left posterior) costal (genital), and is similar in appearance to the other costals, bearing, like them, a genital pore. The anterior left costal is also elongated, and irregular in form, and divided by suture into two parts, of which the anterior is imperforate. The

question is left undecided whether the supplementary costal is due to the reappearance by atavism of a fifth costal, or is the result of duplication of the fourth costal.

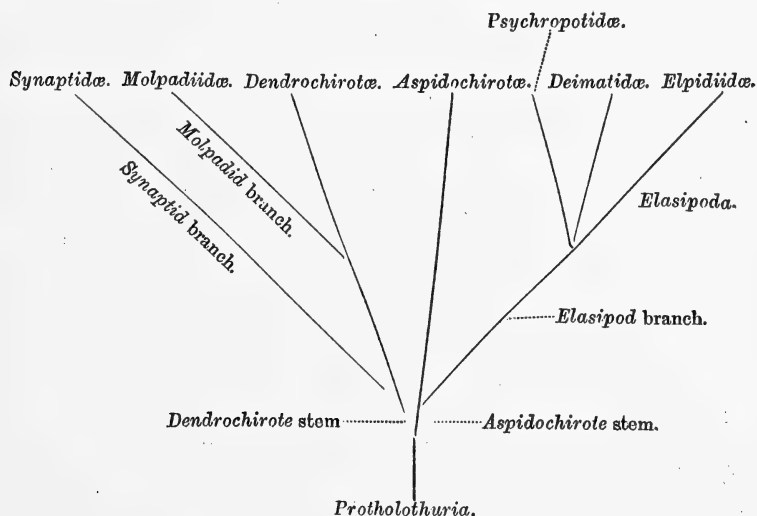
DE LORIO (3) describes some new facts about the stem and centro-dorsal of *Thiolliericrinus* (v. *T. insuetus*, n. sp.), which are of importance if this genus be regarded as a link between *Bourgueticrinidae* and *Antedonidae*. In *Dolichocrinus*, n. g., for *Eugenicrinus aberrans*, the author considers the indented base of the radial circlet as evidence that basals were present in the adult [though none have yet been found].

LUDWIG (1) describes the anatomy of *Ankyroderma musculus*. Tentacles (p. 575), fifteen in number, each finger shaped with a minute lobe on each side near the end. The skin contains calcareous bodies (pp. 576-579) of five kinds, figured on taf. xxix : fig. 1, figs. 2, 3, 4, & 5, fig. 6, fig. 7, and fig. 8. In addition, the skin contains "wine-red corpuscles" (p. 580). These are not calcareous; they are decolourized by acids, but not dissolved, unless the acid is very strong or acts for a long time, when they dissolve without giving off gas. The anal papillæ (p. 582) are five in number, placed radially, and each consisting of an irregularly perforated, elongated calcareous plate. Calcareous ring (p. 585), consisting of five radial pieces (taf. xxxix, fig. 10), and five interradian (fig. 11, a & b). The peculiar distribution of the tentacles (p. 587, with diagram on p. 590) is connected with the symmetry of the lateral radial pieces, and the asymmetry of the median radial pieces of the calcareous ring. Sections through a radius of the body wall (p. 589) show the radial nerve, the pseudohæmal canal, and most internally the radial water-vessel, between which and the pseudohæmal canal are traces of a radial blood-vessel. The longitudinal muscles are paired in the trunk, but unpaired in the posterior tail-like region of the body, into which the radial water-vessels are continued. Each water-vessel gives off three tentacles. There are no retractor muscles. A single Polian vesicle is present. The stone-canal runs in the dorsal mesentery, and is attached to the skin. The sexes are separate, the genital cæca paired. Respiratory trees, alimentary canal, and blood-vessels (p. 591).

The author proceeds to describe the position of *Molpadiidae* and the phylogeny and classification of *Holothurians* in general. The *Molpadiidae*, in combining the absence of tube feet with the possession of respiratory trees, appear intermediate between *Synaptidae*, on the one hand, and the *Aspido-* and *Dendrochirotae* on the other; but in reality they are much more nearly related to the pedate *Holothurians*, and especially the *Dendrochirotae*, with which they agree closely in many points, as shown by a comparison of the organs of the *Molpadiidae* with those of other families (pp. 592-594). The *Dendrochirotae*, *Molpadiidae*, and *Synaptidae* are to be looked upon as arising from a common root, the *Dendrochirotae* representing the main stem, which sent off early a branch, the *Synaptidae*, and later a second, the *Molpadiidae*. The *Aspidochirotae* are separated from all the other families by a number of points (p. 596), and represent a second main stem of the *Holothurians*, connected only at the root with

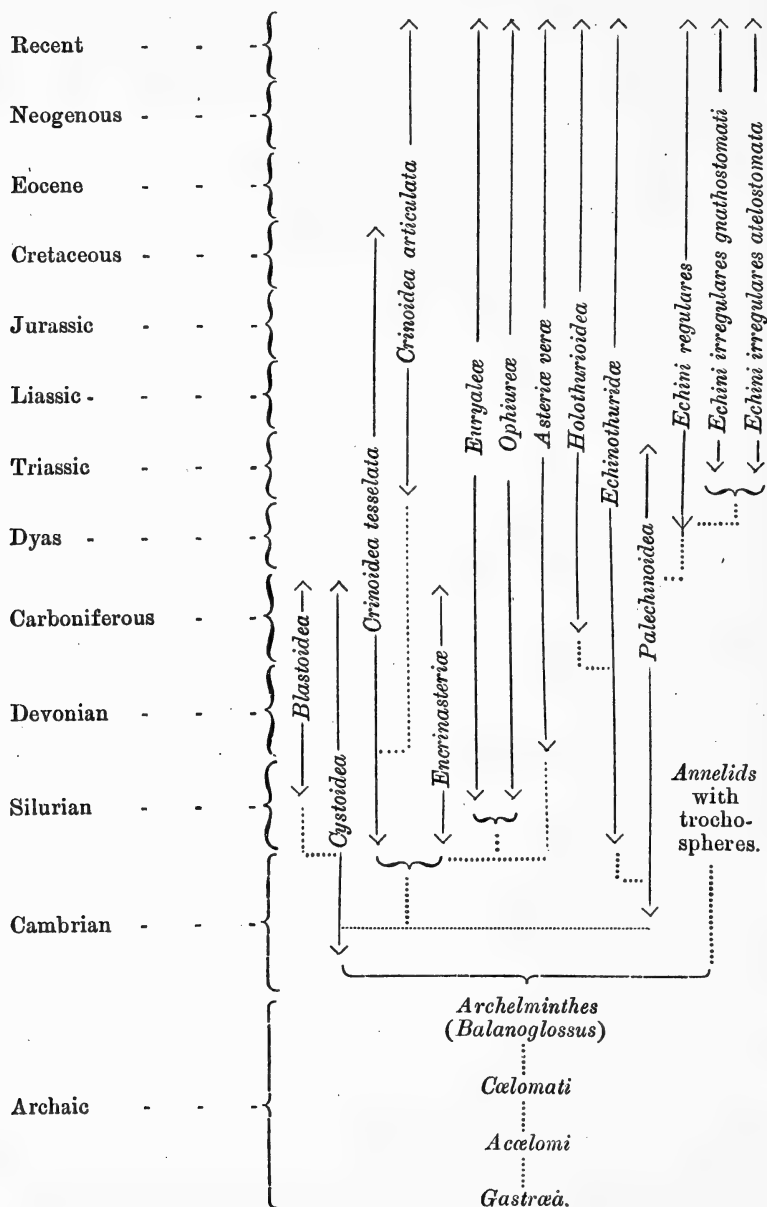
the *Dendrochirote* stem. The three families of *Elasipoda* do not represent categories of equal value with the *Aspido-* and *Dendrochirote* (p. 597), and the *Elasipoda* are to be regarded as a branch of the *Aspidochirote* stem (p. 598). Diagram of *Holothurian* phylogeny (p. 599). The ancestral *Holothurian* had 10 simple tentacles, with ampullæ, springing from the radial canals like the feet, which also had ampullæ. The calcareous ring had 10 pieces; the circular musculature was uninterrupted, and there were no retractors. The stone-canal, lying in the dorsal mesentery, opened to the exterior. The genital cæca were paired. There were auditory vesicles, respiratory trees, and a simply-arranged system of intestinal blood-vessels. The gut had the characteristic curves, and the calcareous plates were lattice-like, with hexagonal faces. From this ancestor arose on one side the *Aspidochirote* stem, on the other the *Dendrochirote*, as the result of diverging modifications of the ancestor (p. 600). As the result of these considerations, the author proposes a new classification of *Holothurians* [*vide* Systematic, pp. 47 & 48; the classification proposed cannot be said to agree well with the author's phylogenetic tree], separating the *Synaptidæ* from all others, since their tentacle vessels arise directly from the water-vascular ring, while in other *Holothurians* they arise from the radial water-vessels. The distinction between pedate and apodous *Holothurians* is unnatural; strictly speaking, none are apodous, since the tentacles are feet modified in connection with the mouth. The *Synaptidæ* are very ancient, but are not on that account the most primitive. They are not degenerate, but highly modified forms.

The author gives the following tree of *Holothurian* phylogeny:—



NEUMAYR (1) argues that the ancestral form of the *Echinothuriæ* must have possessed a firm test and complicated ambulacra, and that the family is immediately related to the *Diadematiæ*, and shows no connection with *Palæechinus*.

NEVIANI discusses the phylogeny of *Echinoderms*, and draws up the following scheme of their descent:—



LUDWIG (5) describes the Morphology of *Holothurians* under the following headings:—Cuvierian Organs, pp. 173–180; Sexual Organs, pp. 180–198; Blood-vascular System, pp. 198–223; Ciliated Organs of *Synaptidæ*, pp. 223–229; Body Cavity, pp. 229–240; Supplement to Morphology, pp. 241–248.

Under the Phylogeny (pp. 447–460), the author comes to the same conclusions as in LUDWIG (1).

LUDWIG (7) and BARTHELS have studied the anatomy of various *Synaptids*, and find that in the adults radial water-vascular canals are wanting. Since they are present in the young, their absence must be due to degeneration, and supports the view that *Synaptids* are not to be looked upon as primitive. Semilunar valves occur in the tentacle canals of all the species examined, and otoliths are also present in all. The so-called eyes on the bases of the tentacles of *S. vittata* are, without doubt, sense organs. The bundles of fibres attached on the inner side of the calcareous wheels of *Chiridota* arise from a cushion of connective tissue common to the whole wheel-papilla, and consist each of six powerful fibres, corresponding in number to the spokes of the wheel, and each attached to the concave inner side of the nave in the angle between two contiguous spokes. In *Myriotrochus* the number of fibres is increased with the spokes.

PERRIER (1) concludes his memoir on the organization of *Antedon rosacea* and *A. phalangium*, giving an account of the absorbent canals, pp. 1–5; the arms and their cavities, pp. 5–19; the chambered organ and the cirrhi, pp. 19–29; the apparatus of irrigation, pp. 29–38, and the genital apparatus, pp. 39–63; and ending with a complete *resumé* of his results, pp. 64–72. In an appendix a comparison of the author's results with those of Hamann is given, pp. 73–77.

PERRIER (4) has studied the skeleton of the young *Asterias*. The odontophores appear as interradial plates in the same meridians as the corresponding primitive interradials, with which they have nothing to do; hence they form no parts of the primitive calyx, but could be compared to the orals of *Crinoids*. The author finds a similar development in the young *Brisinga*, in contradiction to his former statements; the true primitive interradials in this species are microscopic, and fuse with the odontophore. The teeth at their first appearance form an integral part of the first ambulacral pieces. The first true adambulacrals correspond to the interval between the second and third ambulacrals; the last adambulacral is placed between the last ambulacral and the terminal. On the lateral aspect is a double series of marginals having a striking resemblance to *Goniasteridæ*, *Archasteridæ*, and *Astropectinidæ*. They have no definite relation in number and position with the adambulacrals. At the extremity of the arms is a semicircular terminal. The plates of the aboral region are arranged as follows:—(1) a large dorso-central; (2) two plates well developed and distinctly interradial, and a third rudimentary; (3) a circle of ten plates, five exactly radial, and five exactly interradial. The three plates of (2) are

intercalary plates of new origin. The five interradial plates of (3) are the basals. The radial pieces of (3) are, in order of appearance, the second or "basilar radials," while the terminal of the arms are the primitive or "terminal radials." The skeleton of the arms is formed between these two radial plates. It is doubtful if the basilar radials are the homologues of radials in *Crinoids*.

The author further describes the organization of young foetuses of *Asterias spirabilis*. The mouth does not open till a late period. The walls of the digestive sac are full of vitelline globules. The relations of the tubular organ, plastidogenous body (ovoid gland), and hydrophore tube (stone-canal) are carefully studied by sections. The plastidogenous body appears to be at its origin a nearly cylindrical diverticulum of the peritoneal membrane of the intestine, which descends along the hydrophore canal. It is shown that the plastidogenous body has, however, a double origin. It is formed in part by a membrane limiting a schizocoelic cavity,  $\alpha$  (pl. v), which is therefore of mesodermic origin, and in part from the peritoneal membrane, which is of endodermic origin. It is in continuity dorsally (aborally) with the peritoneal membrane of the digestive tract, and ventrally with the septa of subambulacral cavities, in which are hollowed out in many species the blood-vessels of Ludwig, for which the author proposes the name "plastidogenous tubes," or "tubes of Ludwig."

It is shown that the madreporic sieve of *Asterias spirabilis* is the result of the transformation of the primitive dorsal funnel, which increases irregularly, so that its walls are folded, and the folds fuse to form sinuous tubes; these tubes converge towards the summit of the hydrophore canal, and some open directly into it, others into the tubular organ. At the junction of the hydrophore canal and the madreporic sieve, the former has a lateral opening, placing its cavity into communication with that of the tubular organ. The plastidogenous body, or at least the membrane of which it is a differentiation, takes part in the formation of the calciferous tissue surrounding the hydrophore canal, and of the dorsal skeleton in the region adjoining the madreporic sieve. The plastidogenous body also takes a part in forming corpuscles for the body cavity.

The arrangement of the subambulacral cavities and labial ring is described. The nervous system consists, in a young specimen with rays 3 mm. in length, of an external cellular layer,  $\alpha$ , a middle layer of longitudinal fibrils,  $\beta$ , and an inner cellular layer,  $\gamma$ .  $\alpha$  is entirely epithelial, and composed of rounded and fusiform cells. Some of the cells only are prolonged into vertical fibres traversing  $\beta$ . The cells of  $\gamma$  are multipolar, and prolonged into fine filaments, of which some plunge at once into  $\beta$ , and others are continuous with the filaments of a fine network, which unite amongst themselves the fibrous prolongations of  $\alpha$ . The multipolar cells of  $\gamma$  are ganglion cells; the cells with fibrous prolongations of  $\alpha$  are sensory, and the fibres of  $\beta$  are probably nervous, but may possibly be connective tissue.

In *Labidiaster radiosus*, Lovén, intercalary arms are formed round the disc between the primary ones, and the number of rays increases with age. This increase is the result of the budding of new parts upon the disc. The colonial nature of the Asterid body is shown by the fact (1) that mutilated parts are always regenerated; (2) that in a number of species one half of the body is always in a condition of being regenerated, owing to the division of the body in two halves; (3) that an arm accidentally separated can regenerate the whole animal in some species; (4) that in others arms are detached spontaneously, to reproduce the whole body; and (5) that the number of arms is not constant in the same species: all of which characters are shared also by a Hydroid colony. The opposition that has been established between the words colony and the words organism and individual is a purely theoretical conception, drawn from the study of higher animals.

PICTET describes the spermatogenesis and fertilization of *Strongylocentrotus lividus* and other *Echinids*. The spermatocytes divide actively by karyokinesis to form spermatids. The latter contain a homogeneous and refringent nucleus, and at the side of it a number of very refringent granules or cytomicrosomes. The tail of the spermatozoon is formed as an elongation of the protoplasm of the spermatid. The cytomicrosomes are derived from the last spindle of the division of the spermatocytes, and consist of the achromatic portion of the old nucleus. They fuse to form a single "Nebenkern," into the composition of which the polar body of the kinetic spindle probably also enters. The nucleus becomes conical, with the Nebenkern at the base of the cone. The apex of the cone is at first opposite the point of insertion of the tail of the spermatozoon, but as the protoplasm becomes used up to form the tail it is inserted opposite the base of the cone. The complete spermatozoon consists of a head, formed exclusively of the nuclear cone, an intermediary segment formed of the "Nebenkern," and a tail formed of the cytoplasm of the spermatocyte. The Nebenkern is not infrequently lost. Fertilization takes place equally well, whether it is present or absent. Hence fertilization takes place through the nucleus of the spermatid transformed into spermatozoid and nothing else. The cytoplasm plays no important rôle in the process, and the Nebenkern is cast off, and has no utility for the act of fecundation. [Cf. FOL, Embryology, etc., *infra*, pp. 35 & 36.]

ROTHPLETZ describes the minute structure of some supposed Diadematispines from the Oligocene, which are true *Echinoid* spines, and not specimens of *Haploporella fasciculata*, as had been thought. Three plans of structure are distinguished in sea-urchin spines, termed by the author Radioli corticati, Radioli radiati, and Radioli cancellati respectively. The first type is confined to *Cidaridæ* and *Salenidæ*. The third type was supposed to be confined to *Echinometridæ*, but occurs also in *Arbacia pustulosa*. The second type occurs in *Echinoids* generally other than those specially mentioned.

RUSSO (1) finds that in the ovary of *Ophiuroids* the ova undergo a

process of degeneration of their elements, either at their complete development, or in various phases of their evolution. The germinal vesicle and spot are first attacked by a hyaline or colloid degeneration, rarely by a fatty or chromatolytic degeneration. The vitellus and vitelline membrane are next attacked, the former being broken up by swelling of the lecithin. In correspondence with this destruction of the ovarian parenchyma, there is a constant renovation of the same, the elements for which are furnished by the cells of the egg-follicle. In some eggs the germinal vesicle acquires a characteristic form, in which the nuclein is pushed out and expelled. This process appears to be for the purpose of ridding the ovum of the most important element when it is not destined to be fertilized. Thus the ovary shows a continual biological activity in the generation and destruction of its elements.

RUSO (4) describes the spermatogenesis and oogenesis of various *Ophiuroids*, and the morphology of the genital apparatus. The spermatozoa are produced from a succession of elements (spermatogonium, spermatocyte, spermatid), produced from the germinal epithelium. The elements arrange themselves in distinct layers. The mother-cells of the ova arise from the basal epithelium, and multiply in the ovarian tubes by karyokinesis. Some become primitive ova, others follicular cells. The germinal vesicle has at first a reticulum, in which accumulations of chromatin take place at the nodes. The germinal spot at first is produced by an accumulation of chromatin, but finally becomes an isolated body of special structure. The vitellus forms two zones, one close to the germinal vesicle, with a fibrillar structure, and intensely coloured; the other reticular and almost colourless. The follicle, when mature or nearly so, constitutes a syncytium. The ova constantly undergo destruction and renovation [*cf.* RUSSO (1)]. The ova and spermatozoa in *Ophiuroids* have a common origin. Genital orifices always exist. A comparative account is given of the Gonads of various *Ophiuroids*.

For the minute structure of the ovum of *Strongylocentrotus lividus* and *Sphærechinus brevispinosus*, see SCHNEIDER.

WACHSMUTH & SPRINGER divide the skeletal elements of a *Crinoid* into primary and secondary. The primary elements include (1) abactinal plates, viz., stem ossicles, infrabasals, basals, radials, and all brachials, (2) actinal plates, viz., orals and all plates of the ambulacra. The secondary or supplementary elements are all the interrarial, interbrachial, and interambulacral plates, including the anal plates and plates of the tube, or sac.

The simplest form of tegmen in *Crinoids* consists of five interrarial plates meeting over the mouth, the orals. To increase the calycal cavity, interrarial plates were developed between the radials, while interambulacral plates, as well as extensions of the ambulacral plates, gradually intervened between orals and radials. The orals might disappear or remain. As the lower parts of the arms became incorporated in the dorsal cap, more and more ambulacral and interambulacral plates came into the tegmen. The plates of the tegmen were at first small and



yielding, as in the *Ichthyocrinidae* and in most recent *Crinoids*; in this state, when the arms are opened, the ventral surface is depressed, when they are closed it bulges upwards. To afford better protection to the viscera the tegmental plates become more solid; the tegmen, being thus less flexible, was fixed in its protruded state. The covering plates of the ambulacra had perhaps been closed from the beginning, but as, through the upswelling of the tegmen, they were now more exposed, further protection was needed. Consequently, they were lowered beneath the surface, and starting from the solid orals, interambulacral plates closed in over them. Certain of the covering plates, however, especially the axillary pieces, which perhaps could not be so easily covered by other plates, became much stouter, and were still exposed on the surface as solid radial dome plates. In any form highly developed along these lines, e.g., *Batocrinus*, the food-grooves, water-vessels, and blood-vessels are sunk right beneath the tegmen, and are enclosed in a tube consisting of alternating ambulacral or covering plates above, and adambulacral or side plates below. The interambulacral plates of the tegmen send extensions into the interior of the calyx, which spread out and form what was formerly supposed to be a disc. In the *Inadunata fistulata* the dorsal cup never extended beyond the radials, and the tegmen was not developed to the same extent as in the *Camerata*. The orals did not, however, always persist in the simple stage in which they occur in the *Larviformia*, and in many cases they were entirely resorbed, and their places were taken by large covering plates, of which the proximal ones joined in the centre. Ambulacral, and sometimes a small number of interambulacral, plates occur in the tegmen of the *Cyathocrinidae*; besides there are four large plates, one in each interradius except the posterior, which rest against the radials, meet laterally beneath the ambulacra, and may be covered, to a varying extent, by small interambulacrals. A plate often similar to these four, lies between the ventral sac and the mouth; this plate is profusely perforated in various Lower Carboniferous forms, and on either side of it lies a small narrow plate, which meets the adjacent large interrarial plate beneath the ambulacrum. The authors believe that the perforated plate is an anambulacral, and the two narrow plates, and possibly the four larger ones, are subambulacrals. The anal plates are not regarded as homologous with the interradians, but are more supplementary still. [For further account and criticism, see F. A. B., in *Geol. Mag.*, May, 1891.]

### III.—EMBRYOLOGY AND ASEQUAL REPRODUCTION.

BROOKS has studied Starfish larvæ collected at Wood's Holl, and finds that the water system is at first bilaterally symmetrical in every particular, although the right water pore and tube disappear very early in the life of the larva. Soon after the formation of the ciliated bands an

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ingrowth of the ectoderm on each side of the stomach gives rise to the water pore and part of the water tube, meeting and uniting with a tubular outgrowth from the enterocœle. After the disappearance of the right water tube the left migrates towards the middle line. The paired pore canals show a resemblance to the spiracles of *Appendicularia* and tunicate larvæ, in which also paired ectodermal involutions meet diverticula of the digestive tract. [*Vide* FIELD.]

CHADWICK describes reproduction by fission in *Cucumaria planci*. The middle portion of the body became elongated and attenuated, and finally broke in two. The anterior half crawled away, and left the posterior part motionless. After about two weeks the posterior end had developed a new mouth and circlet of tentacles. This process occurred in three specimens, and the posterior half of one divided again, so that seven specimens were obtained from three.

CUÉNOT (1) discusses the asexual reproduction of *Echinoderms*, pp. 629-631.

DRIESCH experimented on the segmenting ova of *Echinus microtuberculatus* by shaking the eggs violently, so as to separate one of the first blastomeres. The remaining blastomere continued to segment, so as to form one-half of a normally segmented ovum. The hemispherical half embryo then closed up to form a blastula, with cells of the usual size, and normal in all respects except that it was smaller by half than the normally developed blastulæ. From these blastulæ were developed gastrulæ, abnormal only in their small size. In many instances, when the shaking did not succeed in separating the blastomeres, twin embryos were formed, which was probably the direct result of injury, due to the shaking, on eggs which would otherwise have produced only a single embryo. [*Cf.* FIEDLER.]

Light was found to have no influence that could be observed, either on the segmentation or the formations of the organs.

FIEDLER experimented on segmenting ova of *Echinoids* by destroying some of the blastomeres, either by pricking them or by continued shaking up of them in a test tube. It was observed that the latter process caused the segmentation to go slower, and produced a certain pause for some time. When one of the two first segmentation spheres was slightly injured by a prick, so that some protoplasm, but not the nucleus, was lost, it was observed during the further segmentation that all the cells descended from the injured cell were smaller than those descended from the other, though otherwise normal. This difference was noticeable, even in the blastula, but after this disappeared. In other similar cases, where the nucleus also was lost, the injured blastomere always died. Most of the eggs operated on only ran through a few stages of segmentation, without reaching the blastula. The blastomeres surviving after the operation usually took on a spherical form, while those in uninjured eggs were elongate ovoids. After removal of one of the first blastomeres, the descendants of the remaining ones very frequently retained for a long time, not only their usual course of development, but also, so to speak,

their traditional relations of position. An eight- or fourteen-cell stage often resulted from one of the two first blastomeres, exactly corresponding to a lateral half of normal sixteen- or twenty-eight-cell stage. This contradicts the idea that the blastomeres in a normal or abnormal ovum take up a position of mechanical equilibrium. The same result takes place on destroying two of the first blastomeres, and it is a matter of indifference whether the cells destroyed are both descendants of the same cell, or each descendants of different cells. On the other hand, the eight first blastomeres are only equivalent to one another externally, and not in their contents, *i.e.*, in the developmental value. If four are left uninjured, the groups of eight resulting from them are different in different cases.

In a few instances half embryos were obtained by destroying one of the two first blastomeres. Three were half blastulas, and two perhaps half gastrulas. Two of the half blastulas were obtained by the pricking method, and were hollow hemispheres. In the third case a blastomere was killed by shaking, and the resulting blastula consisted of two hemispheres, one hollow the other solid; the former had a normal appearance, the latter apparently consisted of a granular mass, the remains of the dead blastomere, covered over by a cell layer continuous with the normal half. [*Cf.* DRIESCH.]

According to FIELD, in *Asterias vulgaris* the formation of mesenchyme precedes, and is continued during, the process of invagination; the cells arise from the endodermal region of the blastula, and any endodermal cell may by division, and probably also without division, become a mesenchyme cell. The cells apply themselves to the wall of the gut and of the body, and on the œsophagus they form a distinct musculature. The connection between the preoral and adoral ciliary bands is secondary, not primary, as Semon supposed. The apex of the preoral lobe has an ectodermal thickening, corresponding in position with the apical plate of *Tornaria*, but without the pigment spots of the latter. Each enterocœle sends up from its dorsal wall a hollow cylindrical protuberance, which meets a solid plug of the dorsal ectoderm, thus forming a right and a left dorsal pore and pore canal. The right pore and canal soon, however, become obliterated. The two enterocœles then elongate anteriorly, and meet and unite in the dorsal lobe. The left enterocœle becomes divided in two by a constriction just behind the pore canal. The posterior part of the anterior enterocœle develops five lobes and becomes the hydrocœle, which does not separate from the anterior enterocœle.

The bilateral larval form of *Echinoderms* is ancestral, and not secondarily acquired. The paired water pores are homologous in their mode of origin, and probably in function, with nephridia.

FOL has studied the fertilization of the ovum in *Asterias*. Shortly after the entrance of the spermatozoon, a small body, "the spermo-centre," detaches itself from it, after which the male pronucleus swells and approaches the female pronucleus. The latter has its "ovocentre,"

which is placed on the side opposite to that from which the polar globules arose. After fusion of the male and female pronuclei, the ovocentre and spermocentre are on opposite sides of the first segmentation nucleus. They next proceed each to divide in two, and the halves travel away from one another round the nucleus, each passing through a right angle. As a result of this quadrille-like march, the demi-ovocentres come to meet the demi-spermocentres, and unite with them to form the first "astrocentres," while the first amphiaster is forming.

The author concludes that fertilization consists not only in the fusion of two demi-nuclei from different sexes, but also in the union of two demi-spermocentres with two demi-ovocentres to form the first two astrocentres, and all astrocentres of the offspring, being derived by division from the two primitive astrocentres, originate equally from the father and from the mother.

JAEKEL (2) discusses some young stages of *Holopocrinidae*. The life conditions under which the family live [*cf.* Physiology and Biology, p. 43] make it absolutely necessary that the larvæ also should be very strongly and massively built, in order to be able to maintain themselves on the spot where the colony is fixed. Hence the young forms show only cœnogenetic adaptations.

LUDWIG (3) describes the development of *Cucumaria planci* from the eighth day onwards. The plane of symmetry of the young Echinoderm does not coincide with that of the larva; but in the anterior (oral) region of the stage transitional between the larva and the young animal, the plane of symmetry diverges from that of the larva towards the left, and in the posterior region towards the right. The two planes of symmetry, therefore, cut one another at acute angles. The longitudinal axis also of the young *Cucumaria* does not coincide with that of the larva, but diverges towards the ventral surface in the anterior region, and towards the dorsal surface in the posterior region. The water-vascular ring and radial canals have assumed their permanent position on the eighth day. The median ventral vessel has the two first tube feet, and on the following days exceeds in length and diameter the other four vessels, of which also the latero-ventral vessels are shorter and narrower than the two latero-dorsal. Muscle-fibres appear first in the median ventral vessel, then in the latero-dorsal, and lastly in the latero-ventral. The muscle-fibres are all longitudinal, and are formed from the cells of the epithelium of the hydrocœle. Five tentacles are developed on the eighth day, which lie in an oral atrium, into which they can be retracted. They are all situated in front of the second ciliated band of the larva (regarding the cilia of the cephalic hump as the first band). The tentacles are arranged asymmetrically with regard to the larval plane of symmetry, but symmetrically with regard to that of the adult. In front lies an unpaired tentacle, followed by four others in two pairs; the exact opposite to the arrangement described by Selenka. The tentacular vessels arise from the growing radial vessels, and are not arranged in regular radial fashion, but are asymmetrical. The two tentacles of the

ventral interradii arise from the median ventral radial vessel; the tentacles of the median dorsal and left dorsal interradii arise from the left dorsal vessel; and the tentacle of right dorsal interradius from the right dorsal vessel. Hence the five primary tentacles of Holothurians cannot, as Semon supposed, determine the true radii of the Holothurian body. Two more tentacles arise, at a much later period, from the right and left ventral vessels, and lie in the left and right dorsal interradii. The tentacles are arranged just as in the seven-tentacled young of *Chiridota rotifera*. In the adult *Cucumaria* each radial vessel gives off two tentacular canals. The valves in the tentacles consist of two semilunar folds. Above the valve a cæcum arises, which becomes the ampulla. Longitudinal muscle-fibres appear in the upper expanded portion of the tentacles, formed by the cells of the hydrocæle. The tentacles are simple cylindrical structures, with rounded tips, up to the fifteenth day, on which they begin to branch. Rudiments of the first two tube feet are present on the eighth day, the right foot being slightly in front of the left. A third foot appears much later, and a fourth still later, both from the median ventral vessel. The fifth foot arises from left dorsal vessel on its left (ventral) side. The Polian vesicle lies in the left half of the body, and its hydrocœlic epithelium forms circular muscles. The young stone canal has a vesicle-like expansion, consisting of flattened epithelium in its outer half. This expansion—the anterior enterocœle of Bury—is the first rudiment of the subsequent madreporic head, and may be termed “madreporic vesicle.” It is surrounded with a lattice-work envelope, formed by the mesenchyma. The distal end of the stone canal and the water-pore lie to the right of the dorsal mesentery. On the ninety-eighth day the madreporic vesicle acquires an opening into the body cavity, and the distal end of the stone canal and water-pore atrophy. Rudiments of the nerve-ring and the radial nerves exist on the eighth day. When fully developed, the nerve-ring and radial nerves consist of a superficial layer of cells, and beneath this a layer of fibres sheltering scattered cells. On the ninth day the tentacular nerves arise, interradii in origin. As early as the eighth day the nervous system of the young animal has lost its connection with the ectoderm, from which it is separated by an intervening layer of mesenchyme. The outer surface of the nerve-ring and radial nerves does not come into contact with the mesenchyme, but is separated by a cleft, which persists as the epineural ring and canals, which are in free communication with one another, but not with any other cavity of the body. Epineural spaces also accompany the tentacular and pedal nerves. The radial nerves are at first in contact with the radial water vessels, but later a fine cleft appears between them which is probably the rudiment of the “pseud-hæmal canal.” Nothing could be observed of the perpendicular fibres, transverse septum, or the two cellular columns of the nerve-cord, which are hence probably secondary acquisitions. No auditory organs were found. The body musculature is formed from the cells of the parietal enterocœle: first the ventral longitudinal muscle, then the transverse museular layer, and after-

wards the four longitudinal muscles of the lateral radii, which follow in the order of their appearance the relations of the radial vessels and nerves. The splitting off of the retractor muscles from the longitudinal ones takes place very late. The calcareous bodies are visible in the larva, and there is no special larval skeleton. Each calcareous body originates as a rod, the ends of which bifurcate repeatedly at angles of  $120^\circ$ , forming a lattice plate. The meshes of the plate each contain several cells. The five anterior plates are arranged radially, and form a sheath for the tentacles, which correspond to the line of contact between two plates. These five plates are in contact posteriorly with five others; but soon the plates increase in size and number, and become imbricate. A second kind of calcareous plate appears about the hundredth day. The calcareous ring is formed from the body wall, and its radial ossicles show relations to the ambulacral ossicles of Starfish.

The ectoderm and mesenchyma in young *Cucumarians* form a single tissue, which does not differentiate till later into a distinct epithelium and subjacent connective tissue.

The blood-vascular system is traceable to remnants of the segmentation cavity, appearing first as a space between the visceral layer of the enterocœle and the endoderm of the mid-gut. In the interradii, a gap remains between the enterocœle and the body-wall, forming the large lacuna described by Herouard. The folding of the intestine begins to be marked on the ninth day, and follows the same course as in the adult animal. The stomach is constricted off from the mid-gut.

LUDWIG (4) describes the early development of *Cucumaria planci*, and contrasts his results with those of Selenka, with which they are very much at variance. The egg contains a first segmentation nucleus, but nothing was to be observed of S.'s "Kernkeimen." In the blastula, cells wander in to form the mesenchyme, not only at the spot which becomes the fundus of the future archenteron, but at any other spot, either from ectoderm or endoderm. The gastrula is complete at the end of the second day. Mesenchymatous dermal and intestinal muscular layers do not exist. The archenteron is bent towards the ventral side, and the blastopore is not terminal, but slightly ventral. At the end of the third day the hydro-enterocœle is separated from the gut, and divided into a hydrocœle and two enterocœles. The hydrocœle forms an irregular horse-shoe with some slight bulgings. The cephalic lobe is now formed, and behind it is a slight depression, which becomes the oral atrium, and furnishes the epithelium of the tentacles and the rudiments of the ring and radial nerves. The oral pit is at first surrounded by ciliated ridges, representing a nearly suppressed Auricularia stage. At the end of the fourth day the hydrocœle has become a ring and bears the stone canal, and rudiments of the five radial canals giving off the five primary tentacle canals. The point of closure of the ring is probably on the right side of the body. The Polian vesicle lies on the left. The rudiments of the two first feet appear simultaneously, but the water-vascular system does not at first take part in their formation.

The first trace of them is an ectodermic pit, at the base of which the epithelium grows rapidly to form a cellular papilla; after which the median ventral radial canal sends out an evagination, which carries the cell growth at the base of the pit before it. The primary tentacle canals are from the first outgrowths of the radial canals. The rudiment of the central nervous system arises as a circular ectodermal ridge on the floor of the oral pit, sending out five prolongations in the direction of the radial canals. The mouth breaks through at the base of the oral pit. The foregut is not ectodermal, but endodermal. The enterocoelomes surround the gut and form a dorsal mesentery, but break through to one another at their ventral point of contact. On the fifth day the nervous system separates from the ectoderm proper, and the epineural canals are formed. The radial nerves and epineural canals grow backwards with the radial water canals. The stone canal now has a bulging of its walls, the future "madreporic vesicle," which from its mode of origin cannot be looked upon with Bury as an anterior enterocoelome. The tentacle which lies in the mid ventral line of the larva becomes the left ventral primary tentacle. At the end of the sixth day the first traces of the calcareous skeleton appear on the stone canal, the ring canal, and the foot canals. They are formed in the mesenchyme. On the ring canal are placed the five rudiments of the radial pieces of the calcareous ring. The mesentery is shifted to the left near the stone canal, and further back it is fixed to the left dorsal region of the body, then to the left ventral, and finally to the right ventral region. The mesentery thus takes the same course as in the adult, and forces a corresponding bending of the gut. On the seventh day longitudinal fibres are beginning to appear in the nervous system. The hyaline papillae appear on the tentacles as cuticular structures. The longitudinal muscles of the hydrocoelome and the tentacle valves begin to form.

LUDWIG (5) describes the ontogeny of *Holothurians* under the following headings:—I. Season of Reproduction, pp. 249 & 250. II. Preliminaries of Development, pp. 251–253. III. The Development of the Larvæ, pp. 253–277. IV. Further Development of the Individual Organs, pp. 278–302.

PERRIER (4) describes the method of fixation of the young in some incubating species of Starfish. In *Asterias spirabilis*, Bell, the young, the number of which does not seem to exceed twenty, are collected in the centre of the lower surface of the disc, and entirely mask the buccal orifice (pl. i, figs. 1 & 2). They are arranged obliquely, with a side of the disc towards the mother. It appears that during the whole period of gestation the mother takes no nutriment. The facts observed in different specimens indicate that the young are attached to the stomachal membrane of the mother, which undergoes a hernia to the exterior to support them. The young are fixed by a short peduncle, or "umbilical cord," through which they perhaps derive nutrition from the mother. This umbilical cord does not arise exactly from the centre of the inferior aspect. In position and aspect it is absolutely identical with the

"brachiolar appendages" of *Asterias violacea*, and corresponds to the "larval organ" of *Asterias flaccida* and *Asterina gibbosa*; in other words, to the preoral lobes of Asterid larvæ. Hence, the "umbilical cord" of these larvæ would correspond to the stem of *Crinoids*. In its anatomical structure the umbilical cord is a diverticulum of the body-wall. The mode of attachment appears to be similar in *Diplasterius lütkeni*, E. P., and *D. steineri*, Studer. *Pteraster ingoufi* and *incisus* also incubate their young.

According to Russo (2), the hydrocœle of *Amphiura squamata* arises from one of the mesoblastic sacs, and becomes divided into five lobes. Each lobe becomes divided by two lateral furrows, first into four portions, which are the future buccal tentacles and the first brachial tentacles. After them a fifth lobe arises, the future radial canal. The water vascular ring arises by elongation of the parts of the hydrocœle vesicle between the five primitive lobes. The Polian vesicles arise as swellings of the interradial tracts. The stone canal commences by an aperture placed in the lower part of the hydrocœle, later becoming a canal placed in the proximity of the five last tentacles. The embryonal calcareous skeleton appears as two spicules, homologous with those of other *Ophiurids*. The permanent ventral skeleton commences with small corpuscles placed close to each tentacle.

Russo (3) finds that in *Amphiura squamata* the segmentation results in a blastula composed of elongated cells, each of which is of an intense red colour in the central part, while the peripheral portion is clear and contains the nucleus. The red colour is derived from the yolk elements of the egg. The endoderm arises by delamination, each cell of the blastula dividing in two, the coloured portion becoming endoderm, the clear portion ectoderm. This multipolar delamination is in connection with the development of the *Amphiura* in the maternal body, and in contrast with *Echinoderms* which develop free in the water, where the development of the endoderm is unipolar.

At this stage a degeneration commences, at a certain pole, first of the ectoderm and then of the endoderm, and by the resulting perforation the proctodæum and archenteron are formed. The mesoderm then arises from the endoderm by delamination, forming two groups of cells on each side of the archenteron. The cells apply themselves to the two primary layers, and thus enclose a space, the body cavity.

Russo (5) describes the segmentation and formation of the germ layers, archenteron, enterocœle, stomodæum, proctodæum, and nervous system, in *Amphiura squamata*. The first two blastomeres are of unequal size; the larger one divides first, so that there is a stage of three nearly equal blastomeres, which is followed by a stage with four. There is a morula, followed by a blastula. The nervous system appears when the stomodæum and proctodæum are formed, and is represented at its origin by four yellowish cells, with prolongations by which they are attached to the ectoderm, and to the stomodæum at the side of which they are situated. They are probably derived from the ectoderm by delamination. [*Cf.* Russo (2, 3).]



Russo (6) gives a *résumé* of the results of his investigations on the embryology of *Amphiura squamata*. It is impossible in this form to distinguish between mesoderm and mesenchyme in the sense of the Hertwigs. A table is given of the organs originating from the ectoderm, mesoderm, and endoderm respectively. The formation is described of the water-vascular system, nervous system, skeleton, muscles of peristome and arms, digestive tract, and bursæ.

The author further describes the genital organs of *Amphiura squamata*. The so-called umbilical cord does not exist. The larva adheres to the wall of the bursæ by means of its external membrane, and is nourished by the bursal epithelium, which breaks down to produce elements that penetrate into the stomach by contraction of the œsophagus.

#### IV.—PHYSIOLOGY AND BIOLOGY.

CUÉNOT (1) discusses various points in the physiology and mode of life of *Echinoderms*. The anchors of *Synapta* serve for locomotion, and to enable the animal to adhere to foreign bodies (p. 354). The hooks of *Ophiurids* are also organs of adherence (p. 356). The Cuvierian organs are organs of defence (pp. 372–374). The means of defence of the different *Echinoderm* classes are discussed at length (pp. 375–383). The function of the ciliated funnels of *Synapta* is to keep the cœlomic fluid in motion (p. 399). Nutrition of the various groups of *Echinoderms* (pp. 414–416). The sacculi of *Crinoids* are organs of reserve (p. 423). Respiration and excretion (pp. 427–441). Hydrostatic (pp. 441–445). The terminal tentacles are perhaps olfactory (p. 498). The otocysts of *Synaptids* and *Elasipoda* and the sphæridia of *Echinids* are both probably organs of the sense of orientation (pp. 504–507). The papillæ on the tentacles of *Synapta* are probably olfactory (p. 514). The Polian vesicle forms amibocytes for the water-vascular system, and also functions as a reservoir (p. 550). Tiedemann's bodies and the so-called Polian vesicles of *Echinids* are lymphatic organs (pp. 552 & 554). The stone canal probably assists in the respiration and excretion of the ovoid gland; it would also maintain the turgescence of the water-vascular system, and perhaps is the means of maintaining the internal pressure during the expulsion of the genital products, *e.g.*, in Urchins (pp. 562–568).

CUÉNOT (5) describes the following *Protozoa* parasitic in *Echinoderms*:—Infusoria: *Uronema echini*, Maupas, from the intestine of *Strongylocentrotus lividus*; *Uronema digitiformis*, Fabre-Domergue, commensal on the skin of *Asterias glacialis*; *Hemispeira asteriasi*, Fabre-Domergue, from the dermal branchiæ of *Asterias glacialis*; *Licnophora auerbachii*, Grabe, from various *Echinoderms*; *Cyclochæta asterisci*, from the dermal branchiæ of *Asterina gibbosa*; *Cyclochæta ophiothrices*, Fabre-Domergue, from *Ophiothrix fragilis*; *Trichodina synaptæ*, n. sp., from body cavity of *Synapta inhærens*; *Trichodina antedonis*, n. sp., commensal on *Antedon rosacea*; *Rhabdostyla arenasia*, n. sp., commensal on the skin of *Synapta*

*inhærens*, and *Vorticella amphiuæ*, n. sp., commensal on *Amphiura squamata*. Dinoflagellata: *Procentrum micans*, Ehrenb., from the gut of *Antedon rosacea* and ? *Procentrum*, sp., in the ambulacral groove of *Echinaster sepositus*. Sporozoa: *Syncystis synaptæ*, Ray Lank., from cœlome of *Synapta inhærens*; *Syncystis mülleri*, Giard, sp., from cœlome of *Synapta digitata*; *Syncystis holothuriæ*, A. Schn., from cœlome of *Holothuria tubulosa* and *Lithocystis schneideri*, Giard, from the cœlome of *Echinocardium cordatum*.

DEMOOR & CHAPEAUX have studied the physiology of the nervous system of *Asterias rubens*, and arrive at the following conclusions:—

A. Movements of the arms and re-assumption of the normal position. The two nervous systems, condensed and diffuse, have each a distinct and absolutely autonomous physiological rôle. The co-ordinated movements which bring about the re-assumption of the normal position of the animal are reflexes, depending upon the condensed nervous system. The intervention of the centres united round the mouth increases the rapidity of the phenomenon.

B. Autotomy, as a motor reaction; is a reflex which has a centre in the nerve ganglion of the arm. The intensity of the phenomenon is a function of the number of ganglia working co-ordinately.

C. Reactions of the ambulacral tentacles. Retraction of the tentacles is the result of a simple reflex, the irradiation of which, in the nervous system, is the more rapid the nearer it takes place to the peribuccal cord. Thus the periesophageal nerve centres have an influence on this phenomenon. Extension of the tentacles is a reflex of the second order, consequent on an irritation diffusing itself strongly in the same nervous apparatus. This irritation is determined by the strong stimulation of some point of the condensed nervous system, which brings about locally the primary reflex, *i.e.*, retraction, or by a stimulation of the diffuse nervous system transmitted to the ventral nervous system. The phenomenon of extension of the tentacles does not necessarily depend on the functions of the ganglia, although the influence of the ganglia acts notably on the propagation of this reflex, which is always centrifugal. The reactional capacity of the normal *Asterias* depends on the integrity of the diffuse nervous system. This apparatus gives the condensed nervous system the power to react, and it is the first cause of the automotricity which constitutes the principal function of the condensed nervous system.

D. Movements of the tubules and pedicellariæ are independent of the condensed nervous system, and depend exclusively on the diffuse nervous system in the deeper layer of the epithelium of the skin. Some bodies produce extension of the tubules, others retraction, others diminish, and others again increase the reactional power of the tubules, while others finally do not affect it.

E. Movements of isolated dorsal integuments. They try to right themselves when put in an abnormal position, the cause of which appears to be the tonicity of the integuments.

The two nervous systems, though quite distinct in function and activity, can work co-ordinately. The diffuse nervous system has the special function of perception and sensation, and the condensed nervous system is the centre of motor reaction.

The authors further describe the influence of poisons and of heat on *Asterias rubens*.

DURHAM finds that insoluble particles introduced into the body-cavity of *Asterias rubens* are ingested by leucocytes, which then make their way through the walls of the dermal branchiæ to the exterior and disintegrate. Similarly leucocytes containing refringent spherules, which are products of normal metabolism, emigrate from the body, and by their disintegration produce a brownish slime on the exterior. This process occurs both in the dermal branchiæ of *Asterias*, and in the ambulacral branchiæ of *Echinus sphæra*. In the latter case the spheruliferous cells of the branchiæ differ from those found in the dorsal organ. In *Spatangus purpureus* and *Amphidotus cordatus*, the process of removal of products is associated with the formation of pigment, and takes place (1) at any part of the surface of the body; (2) in the neighbourhood of the rosette feet, and in the feet themselves; (3) into the tubes of the madreporite, from whence the leucocytes probably wander to the exterior, if not carried out by an efferent current.

The author compares these results with those obtained in other groups of the animal kingdom, and discusses the phenomenon of excretion from the skin. It is pointed out that if (excretory) pigment granules are brought to the surface more rapidly than they are got rid of, pigmentation will ensue, and that pigment which has done its work may be thus retained to colour the individual.

The hæmal system, with its central dorsal organ (ovoid gland), is regarded as an apparatus for distributing nutrient substances along the body, for producing amœboid corpuscles, and for the working up of effete material. The only methods of communication between the hæmal system and other spaces is (1) by osmosis; (2) by diapedesis of corpuscles.

For the influence of freshwater on Echinoderms (*Antedon rosacea*, *Synapta inharens*, various *Ophiurids* and Starfish) see GOGORZA.

JAEKEL (2) discusses the mode of life of the *Holopocrinidæ*. They are inhabitants of coral reefs in shallow water, and subject to strong currents, with reference to which the animal has an oblique position on the stem, so that the ventral surface is turned towards the current. The arms inserted higher up are generally more strongly developed than those lower down.

LOEB describes experiments to show that *Cucumaria cucumis* is obliged to maintain a certain position in relation to gravity, always remaining attached to vertical surfaces or creeping on them. It is shown that light, want of oxygen, &c., have no influence in bringing about this result, which depends on the effect of gravity only. *Asterina gibbosa* is negatively geotropic. *Asterina tenuispina*, on the other hand, is not geotropic, but is positively heliotropic.

LUDWIG (5), under the heading "Physiology and Œcology of *Holothurians*," discusses the following points:—I. Function of single Organs and systems of Organs, pp. 383–410. II. Occurrence and Locomotion, pp. 410–415. III. Nocturnal Life, p. 415. IV. Food and Feeding, pp. 416–418. V. Reaction to strong Stimuli, pp. 418–422. VI. Life in Captivity and Tenacity of Life, pp. 422 & 423. VII. Regeneration, pp. 423 & 424. VIII. Length of Life and rate of Growth, pp. 424 & 425. IX. Enemies, p. 425. X. Protective arrangements, p. 426. XI. Abnormalities, pp. 427 & 428. XII. Parasites, pp. 428–432. The author further discusses their Use for Mankind, pp. 433–437.

MINGAZZINI describes two species of Gregarines, *Cystobia holothurice*, A. Schn., sp. from *Holothuria tubulosa*, and *C. schneideri*, n. sp., inhabiting *Holothuria poli* and *H. impatiens*. [Cf. CUENOT (5).]

SEMPER suggests that the autotomy of *Holothurians* may have a definite biological importance for the parasitic *Ectoconcha mirabilis* in their body cavity, the young of which could become free by producing autotomy through internal stimulation.

## V.—DISTRIBUTION.

### A.—GEOGRAPHICAL (FAUNISTIC).

Arctic *Comatule*; CARPENTER (2).

British *Ophiuroids*; BELL (6).—British *Echinoidea*, complete list; HOYLE.—Cardiff, *Echinodermata*; JAMES, p. 190.—W. Coast of Ireland; HERDMAN, pp. 201 & 202.—S.W. Coast of Ireland; SLADEN (1).

W. Greenland, *Echinoderms*; IVES (3).

Bergen, Echinoderm fauna; BRUNCHORST, p. 30.

Arcachon, Echinoderm fauna; FISCHER.

Spain: Arago and à Rosas (various Echinoderms); LACAZE-DUTHIERS.

Azores and Terre-Neuve, *Stellerids*; PERRIER (2).

Madeira, *Crinoids*; CARPENTER (3).

New England, *Echinodermata*; FEWKES.

Labrador Coast; PACKARD, pp. 370 & 371.

Bahama Is., *Echinoderms*; IVES (2).

Japanese *Echinoderms*; IVES (1).

Ceylon, *Echinoderms*; LUDWIG (6).

Indian Archipelago, *Comatulids*; HARTLAUB (1).

Indian Ocean and Bay of Bengal (*Holothurians*); WALSH: *Echinodermata* generally; WOOD-MASON & ALCOCK (1, 2).

Port Phillip, *Antedonidae*; CARPENTER (4).

Cape Horn, *Stellerids*; PERRIER (4).

### B.—GEOLOGICAL.

Lower Cambrian, *Olenellus* Zone; WALCOTT (2).—Cambrian of Scandinavia; BORNEMANN.—Cambrian of Acadia; MATTHEW.

Hudson River Group; WALCOTT (1).—Lower Niagara Limestone of

Lockport, N. Y. (*Crinoids*); RINGUEBERG.—Lower Silurian (Niagara Group) of Tennessee and Indiana; MILLER (3).—Wenlock Limestone (*Crinoids*); BATHER (1, 2, 5).—Trenton Formation, Ottawa; BILLINGS (1, 2, 3, 4), GRANT (2), & AMI (1).—Upper Silurian, Victoria (occurrence of *Palæaster meridionalis*, n. sp.); ETHERIDGE.

Devonian of the Straits of Dover (2 new *Crinoids*); EHLERT (2).—Devonian, Mackenzie River Basin (1 *Crinoid*, *Arachnocrinus canadensis*, n. sp.); WHITEAVES.

Waverley or Kinderhook Group, Legrand, Iowa (*Crinoids*, *Schanaster legrandensis*, n. sp., and *Archæocidaris legrandensis*, n. sp.); MILLER & GURLEY.—Waverley Group, Ohio (*Crinoids*); COOPER.—Keokuk Beds of Iowa (*Crinoids*); GORDON (2, 1).—Subcarboniferous (Keokuk Group, Chouteau Limestone, &c.) of Missouri, Indiana, and Alabama; MILLER (3).—Subcarboniferous Rocks, Indiana, Missouri, and Iowa; MILLER & GURLEY.—Subcarboniferous of Pike and Marion Counties, Mo., and Scott County, Va.; ROWLEY (4, 5) & HARE.—Shan Hills, Upper Burmah (2 *Crinoids*, sp. indet., and 1 new *Echinospherites*); NOETLING.—Subcarboniferous and Coal Measures of Indiana, Missouri, and Iowa; MILLER & GURLEY.—Lower Carboniferous *Crinoids* from Missouri; MILLER (1).—Flint, Mold, and Ruthin, *Echinodermata*; STRAHAN.—Coal Measures of Kansas City (1 new *Crinoid*); BUTTS.—Coal Measures of Missouri; MILLER (3).—Upper Coal Measures, Kansas City, Missouri (*Crinoids*); MILLER & GURLEY.

Lower "Muschelkalk" of Java; WAGNER.—Trias of Sardinia (*Encrinus liliiformis*); STEFANI.

Lias of Sardinia (*Pentacrinus*); STEFANI.—Middle Lias of Alderton Hill, Gloucestershire (1 *Crinoid*, *Extracrinus subangularis*, Miller); SMITHE.—"Grey Limestone," South Alps (1 *Crinoid* and 4 *Echinoids*, 2 new); GLOCKELSTHURN.—Lias and Jura of Portugal (*Echinoids*, 1 *Asteroid*, and *Crinoids*); DE LORIOI (3).

Jurassic of Hausdorf, near Inowrazlaw (3 species of *Cidaris*, and *Crinoid* fragments); LANGENHAN.—Jurassic Echinoderms of Portugal; DE LORIOI (3).—Oxfordian and Kimmeridian of Pologne; SIEMI-RADZKI.—*Holopocrinidae* of Stramberg; JAEKEL (2).

Jura and Cretaceous of Mexico (2 new *Crinoids* and 3 *Echinoids*, 1 new); FELIX.

Neocomian, Mexico (1 *Echinoid*, *Cyphosoma aquitanicum*, Cott.); FELIX & LENK.—Neocomian of Yonne (2 *Echinoids*); GAUTHIER.

Valangian of Chambotte (*Goniopygus decoratus*, Desor, and species of *Cidaris*, &c.); PILLET.

Turonian of Dracy (1 *Echinoid*, *Holaster*, sp. ?); GAUTHIER.—Cretaceous of Upper Bavaria (several *Echinoids*, 1 new *Ophiurid*, and 2 *Crinoids*); BÖHM.—Cretaceous *Echinoids* of N. America; CLARK.—Cretaceous of Mexico; HEILPRIN.—Cretaceous of the Basins of the Don and the left affluents of the Dnieper (4 *Echinoids*, *Ananchytes*, *Cidaris*, and *Spatangus* species); PIATNITZKY.—Cretaceous (2 abnormal *Echinoids*); ROBERTS.—Cretaceous of N. Germany (regular *Echinids*);

SCHLÜTER.—Cretaceous *Echinoids* of W. Pyrenees; SEUNES.—Cretaceous British *Asteroidea*; SLADEN (2).—Belemnite Chalk of Yonne (3 *Echinoids*); GAUTHIER.—Pyropen Sands of the Priesen and Teplitz Layers; JAHN.

Cainozoic *Echinoids* of Great Britain; GREGORY (3). The London Clay *Echinoids* are dwarfed subtropical forms. The Lower Eocene *Echinoids* are more allied to those of the Lower than of the Upper Chalk. The author believes that a connection must have been established between the British Sea and that of the Mediterranean Basin in the Middle, and perhaps Upper, Eocenes. The Crag Echinoid fauna is of twofold origin, containing, in addition to the Atlantic forms, a series of genera found in the Mexican and Antillean regions, or of species allied to these. This implies some direct connection of warm, shallow sea, and probably points to the existence of at least a ridge or chain of islands across the southern part of the N. Atlantic.

Old Tertiary Echinid genera; BITTNER.—Tertiary of Saxony: *Echinoids*; FUTTERER, pp. 12, 13, & 15.—Marine Tertiary of Carry, Sausset, and Couronne, near Marseilles (*Echinoids*); GOURRET.—Tertiary *Echinoids* of Australia; GREGORY (1).—Lower Limestone, Malta, correlation and *Echinoidea* of; *id.* (4) pp. 631–636.—Greensand, Malta (Helvetian), correlation and *Echinoidea* of; *id.* (4) pp. 631–638.—Globigerina Limestone, Malta (Upper Portion, Langhian; Lower Portion, Aquitanian), correlation and *Echinoidea* of; *id.* (4) pp. 631–638.—Upper Coralline Limestone, Malta, correlation and *Echinoidea* of; *id.* (4) pp. 631–638.—Eocene *Echinoids* of Alicante; COTTEAU (1).—Eocene *Echinoids* of France; *id.* (3).—Eocene of Loire-Inférieure and La Vendée (*Echinoids*); *id.* (5).—Eocene of Alabama, *Echinoids*; DE GREGORIO, (2) pp. 250–253.—Eocene of Australia (*Echinoids*); TATE.—Oligocene of Astrupp (*Diademid* spines); ROTHPLETZ.—Upper Oligocene of the Doberg (*Echinoids*); LIENENKLAUS.—Marine Miocene of Syria; BLANCKENHORN.—Miocene and Pliocene of Algeria; COTTEAU (4), PERON & GAUTHIER.—Pliocene *Echinoids* in the Yorkshire Museum; GREGORY (2).—Post-pliocene of Balestrate (2 *Echinoids*); DE GREGORIO (1).—Marine accumulations of North Ireland; A. BELL.

Japan, Palæontology; NAUMANN & NEUMAYR.

## VI.—SYSTEMATIC AND CLASSIFICATION.\*

### 1. ECHINODERMATA (in General).

BELL (5) proposes the following classification of *Echinoderms*:—

Branch A. INCALICULATA.

Stage A. *Anactinogonidiata*.

Class 1. *Holothurioidea*.

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\* A † preceding the name of a species indicates that the reference following is palæontological; a † followed by a ; at the beginning of a paragraph indicates that all the references in that paragraph are palæontological.

## Branch B. CALICULATA.

Stage A. *Anactinogonidiata*.Class 2. Some *Cystidea*?Stage B. *Actinogonidiata*.1st Sub-branch. *Statozoa*.Substage i. *Apelmatozoic*.Class 3? "Some *Cystidea*."Class 4? Some *Crinoidea*.Class 5? Some *Blastoidea*.Substage ii. *Pelmatozoic*.Class 6. *Crinoidea* (s.s.).Class 7. "*Cystidea*."Class 8. *Blastoidea* (s.s.).2nd Sub-branch. *Eleutherozoa*.Division i. *Zygopoda*.Class 9. *Echinoidea*.Division ii. *Azygopoda*.Class 10. *Asteroidea*.Class 11. *Ophiuroidea*.CUÉNOT (1) proposes the following classification of *Echinodermata* :—Class I. *Synaptida*.Class II. *Holothurioidea*.1. *Elasipoda*2. *Pneumonophora*  $\left\{ \begin{array}{l} \textit{Pedata.} \\ \textit{Apoda.} \end{array} \right.$ Class III. *Pelmatozoa*.1. *Cystidea*.2. *Blastoidea*.3. *Crinoidea*.Class IV. *Echinoidea*.1. *Atelostomata*.2. *Gnathostomata*  $\left\{ \begin{array}{l} \textit{Irregulares.} \\ \textit{Regulares.} \\ \textit{Palechinoida.} \end{array} \right.$ Class V. *Ophiuroidea*.Class VI. *Asteroidea*.PERRIER (3) adopts the following classification of *Echinoderms* :—Embranchement A. *Anangia*, without absorbent canals.*Stellerids*, *Ophiurids*.Embranchement B. *Angiophora*, with absorbent canals.*Crinoids*, *Echinoids*, *Holothuroids*.

## 2. HOLOTHURIOIDEA.

LUDWIG (1) proposes the following classification of the *Holothurioidea* :Order I. *Actinopoda* (with the tentacle canals springing from the radial canals).Family 1. *Aspidochirota*.

Family 2. *Elusipoda*.Subfamily 1. *Psychropotidae*.Subfamily 2. *Deimatidae*.Subfamily 3. *Elpidiidae*.Family 3. *Dendrochirota*.Family 4. *Molpadidae*.Order 11. *Paractinopoda* (with the tentacle canals arising directly from the ring canal).Family 5. *Synaptidae*.

For a history of the system of Holothurians, with a discussion of the importance of the body form for the system, see LUDWIG, (5) pp. 303-325.

For a detailed systematic list of the orders, families, genera, and species of Holothurians, with diagnoses of the orders, families, and genera (3 new genera), see LUDWIG, (5) pp. 325-361.

For the horizontal distribution of Holothurians, see LUDWIG, (5) pp. 362-379; for the vertical distribution, *id.* pp. 379-382; for the palæontology, *id.* pp. 438-446.

*Holothurioidea* occurring on the New England coast; FEWKES, p. 90: of Labrador coast; PACKARD, p. 371: various *Holothurioidea* from the Bay of Bengal; WOOD-MASON & ALCOCK, (1) p. 15, and *id.* (2) pp. 442 & 443.

*Amphigynmas*, n. g., for *A. multipes*, n. sp.; WALSH, p. 199, Andaman Sea, 188-220 faths., Green Mud.

*Ankyroderma*. LUDWIG (1) revises the genus, and reduces the number of species to seven, as follows: (1) *A. musculus*, Risso, synn. *A. perrieri*, Petit, 1883, *A. hispanicum*, Petit, Mediterranean, Cape Finisterre, 36-285 faths.; (2) *A. jeffreysii*, Dan. & Kor., synn. *A. affinis*, Dan. & Kor., 1879, *A. jeffreysii* var., Théel, 1886, *A. affine* var., Théel, 1886, Arctic, N. Atlantic and Lesser Antilles, 127-810 faths.; (3) *A. roretzii*, v. Mar., 1881, Japan; (4) *A. danielsseni*, Théel, 1886, Antarctic Ocean, 400 faths.; (5) *A. simile*, Théel, 1886, Japan, 345 faths.; (6) *A. marenzelleri*, Théel, 1886, E. New Zealand, 700 faths.; (7) *A. agassizii*, Théel, 1886, Lesser Antilles, 1507 faths.

*A. danielsseni*, Théel, Andaman Sea, Green Mud, 265 faths., WALSH, p. 202; *A. marenzelleri*, Théel, Bay of Bengal, 480-500 faths., Globigerina Ooze, *id.* p. 203.

*Apodogaster*, n. g., for *A. alcockii*, n. sp.; WALSH, p. 202, Bay of Bengal, 561 faths., Grey Mud.

*Benthodytes gelatinosa*, WALSH, pp. 200-202, Andaman Sea, 271, 490, & 188-200 faths., Green Mud; *B. ovalis*, *id.* p. 200, Andaman Sea, 490 faths., Green Mud: n. spp.

*B. papillifera*, Théel, Bay of Bengal, Globigerina Ooze, 1748 faths.; WALSH, p. 200. *B. sanguinolenta*, Théel, Bay of Bengal, Globigerina Ooze, 1803 faths.; *id.* p. 200.

*Caudina caudata*, Sluiter, var.?, described by LUDWIG (2), from Java.



*C. coriacea*, Hutton, *C. ransonnetii*, von Mar., and *C. caudata*, Sluiter, should perhaps all be included under the name *C. coriacea*; *id.* (2).

*Cucumaria hyndmanni* (Thompson), Forbes, 345 faths., S.W. Coast of Ireland; SLADEN, (1) p. 702.

*Deima pastorum*, Théel, Bay of Bengal, 1520 faths.; WALSH, p. 198. *D. validum*, Théel, Bay of Bengal, Globigerina Ooze, 1840 & 1748 faths.; *id.* p. 198.

*Euphronides depressa*, Théel, Bay of Bengal, Globigerina Ooze, 1803 faths.; WALSH, p. 200.

*Eupyrgus scaber*, Lütken, Andaman Sea, 60 faths., Laccadive Sea, 738 faths., Green Mud, Bay of Bengal, 405 faths., Green Mud; WALSH, p. 203.

*Holothuria intestinalis*, Asc. & Rthke., 750 faths., and *H. tremula*, Gunner, 345 faths., S.W. Coast of Ireland; SLADEN, (1) p. 702. *H. nigra*, from Cardiff; JAMES, p. 190.

*Latmogone spongiosa*, Théel, Bay of Bengal, 1924 faths.; WALSH, p. 200. *L. violacea*, Théel, S.W. Coast of Ireland, 750 faths.; SLADEN, p. 702.

*Microdactyla*, Sluiter: the genus is insufficiently grounded, and its single species, *M. caudata*, should be referred to the genus *Caudina*; LUDWIG (2).

*Oneirophanta mutabilis*, Théel, Andaman Sea, 250 faths.; WALSH, p. 197.

*Orphnurgus asper*, Théel, var. *glaber*, n. var.; WALSH, p. 198, Bay of Bengal, 561 faths., Grey Mud.

*Pannychia wood-masoni*, n. sp., WALSH, pp. 198 & 199, Andaman Sea, 188–220 & 490 faths., Green Mud.

*Peniagone wyvillii*, Théel, Bay of Bengal, Globigerina Ooze, 1803 faths.; WALSH, p. 197.

*Stichopus natans*, Sars, 750 faths., S.W. Coast of Ireland; SLADEN, (1) p. 702.

*Théelia*, n. g., LUDWIG, (5) pp. 349 & 350, for *Psolus ambulatrix*, Bell, *P. cataphracta*, Sel., *P. disciformis*, Théel, and *P. incerta*, Théel.

*Thyonidium pellucidum* (Fleming), Düb. & Kor., 50 faths., S.W. Coast of Ireland; SLADEN, (1) p. 702.

*Trochodota*, n. g., LUDWIG, (5) p. 359, for *Chiridota studeri*, Théel, and *C. venusta*, Semon.

*Trochostoma andamanense*, n. sp., WALSH, pp. 203 & 204, Andaman Sea, 500 faths., Green Mud.

### 3. ECHINOIDEA.

*Echinoidea* of the New England Coast; FEWKES, p. 90: of the Labrador Coast; PACKARD, p. 571: of Cardiff; JAMES, p. 190: various *Echinoidea* from the Bay of Bengal; WOOD-MASON & ALCOCK, (1) p. 15.

† *Acrocidaris nobilis*, Ag., from Upper Jura of Oaxaca, Mexico; FELIX, p. 175: from Jurassic of Portugal; DE LORIO, (3) pp. 80 & 81, pl. xiv, figs. 8–20.

†; *Acropeltis aequituberculata*, Ag., Jurassic of Portugal; DE LORIOI, (3) pp. 93 & 94, pl. xvi, fig. 4. Synonym, *A. concinna*, Merián.

†; *Acrosalenia angularis* (Ag.), Desor, Jurassic of Portugal; DE LORIOI, (3) pp. 49 & 50, pl. ix, fig. 4. Synonyms: *Milnia decorata*, Haime. *A. delgadoi*, de Lor., Jurassic of Portugal; DE LORIOI, (3) pp. 51 & 52, pl. ix fig. 7. *A. masconi*, Cott., Jurassic of Portugal; *id.* (3) pp. 53 & 54, pl. ix, fig. 10. *A. ribeiroi*, de Lor., Jurassic of Portugal; *id.* (3) pp. 52 & 53, pl. ix, figs. 8 & 9. *A. tenella*, de Lor., Jurassic of Portugal; *id.* (3) pp. 54 & 55, pl. x, figs. 1-7. *A. tuberculosa*, Ag., v. sub. *Pseudosalenia aspera* (Ag.), Etallon. *A. venusta*, de Lor., Jurassic of Portugal; *id.* (3) pp. 50 & 51, pl. ix, figs. 5 & 6.

†; *Agassizia aequipetala*, GREGORY, (3) pp. 39-41, pl. i, fig. 7, Coralline Crag, Aldborough; *A. heinzi*, PERON & GAUTHIER, Miocene (?) of Algeria, see COTTEAU, (4) pp. 101-103, pl. ii, figs. 2-5 : n. spp.

†*Alexandria magnifica*, Pfeffer, New Caledonia; DE LORIOI, (2) pp. 20 & 21.

*Amblypygus*, Ag., definition of genus; COTTEAU, (1) p. 50.

†; *A. dilatatus*, Ag., Eocene of Callosa, Alicante; *id.* (1) p. 51. *A. melitensis*, Wright, Upper Coralline Limestone, Malta; GREGORY, (4) p. 600.

†; *Amphiope bioculata*, Aquitanian and Langhian of Carry, near Marseilles; GOURRET, p. 130. *A. elliptica*, Desor, Langhian of Carry, near Marseilles, *id. ibid.* *A. palberata*, Pomel, Miocene of Algeria; COTTEAU, (4) pp. 160 & 161.

†*Ananchytes ovata*, Lam., from Cretaceous, Russia; PIATNITZKY, pp. 13, 15, 172, & 174. *A. striatus*, Lam., from Cretaceous, Russia; *id.* p. 175.

*Anapesus*: definition of genus; COTTEAU, (4) pp. 245 & 246.

†; *A. maurus*, Pomel, Pliocene of Algeria; *id.* (4) pp. 249 & 250. *A. sahelensis*, Pomel, Pliocene of Algeria; *id.* (4) pp. 247-249. *A. serialis*, Pomel, Pliocene of Algeria; *id.* (4) pp. 250 & 251.

*Arachnoides placenta*, L., diagnosis and distribution: HOYLE, p. 420.

†; *Arbacina asperata*, Pomel, Pliocene of Algeria; COTTEAU, (4) pp. 260 & 261. *A. massylea*, Pomel, Miocene of Algeria; *id.* (4) pp. 258 & 259. *A. nicaisei*, Pomel, Pliocene of Algeria; *id.* (4) pp. 261 & 262. *A. sahelensis*, Pomel, Pliocene of Algeria; *id.* (4) pp. 259 & 260.

†; *Archæocidaris edgarensis*, Worthen & Miller, from Lower Coal Measures, Iowa; KEYES, pp. 245 & 246. *A. urei*, Flem., Calcareous Sandstone and Black Limestone; STRAHAN, p. 228.

†*A. legrandensis*, n. sp., MILLER & GURLEY, p. 59, pl. x, fig. 15, Kinderhook Group, Iowa.

*Asthenosoma hystrix*, Wyv.-Th., and *A. fenestratum*, Wyv.-Th., distribution and diagnosis; HOYLE, pp. 407 & 408.

†*Botriopygus alabamiensis*, n. sp., CLARK, p. 76, Cretaceous, Alabama.

†*Breyrella*, n. g., GREGORY, (4) pp. 600 & 601, for †*Pygorhynchus rasalli*, Wright, and a new species. †*B. equizonata*, n. sp., *id.* (4) pp. 602 & 603, pl. ii, figs. 1a-c, Lower Coralline Limestone, Malta. †*B. rasalli*,

Wright sp., Globigerina Limestone, Malta, *id.* (4) p. 602: synonym, †*Echinanthus corsicus*, Cott.

*Brissopsis*, Ag., definition of genus; COTTEAU, (1) p. 23. *B. lyrifera*, Forbes, diagnosis and distribution; HOYLE, pp. 422–424, and 50–54 faths.: S.W. coast of Ireland; SLADEN, (1) p. 702.

†; *B. crescenticus*, Wright, Miocene of Algeria; COTTEAU, (4) pp. 93 & 94, and Globigerina Limestone, Malta, GREGORY (4) pp. 622 & 623. *B. duciei*, Wright, Upper Coralline Limestone, Malta; *id.* (4) p. 622. *B. vilaplanae*, Cott., Eocene of Callosa, Alicante; COTTEAU, (1) pp. 24–26, pl. iii, figs. 5–8: [n. sp. ?]<sup>c</sup>.

†; *B. durandi*, PERON & GAUTHIER, Pliocene of Algeria, see COTTEAU, (4) pp. 95–98, pl. i, figs. 7 & 8; *B. meslei*, PERON & GAUTHIER, Miocene of Algeria, *id.* (4) pp. 94 & 95, pl. i, figs. 5 & 6: n. spp.

*Brissospatangus*, Cott., definition of genus; COTTEAU, (1) p. 18. †*B. vilanova*, Cott., Eocene of Callosa, Alicante; *id.* (1) pp. 19 & 20, pl. ii, figs. 9–13: [n. sp. ?]<sup>c</sup>.

†; *Brissus latus*, Wright, Upper Coralline Limestone, Malta; GREGORY, (4) p. 619. *B. oblongus*, Wright, Upper Coralline and Globigerina Limestone, Malta, *id.* (4) p. 620: synonym, *B. cylindricus*, Desor. *B. tuberculatus*, Wright, Upper Coralline Limestone, Malta; *id.* (4) p. 620. *B. unicolor*, Leske, Pliocene, Yorkshire; *id.* (2) p. 42: Pliocene of Great Britain; *id.* (3) pp. 41 & 42.

†*B. nicaisei*, n. sp., Pliocene, Algeria, PERON & GAUTHIER, see COTTEAU, (4) pp. 90–92, pl. ii, fig. 1.

†; *B. cordieri*, Ag., doubtful if from Malta; GREGORY, (4) p. 629. *B. cylindricus*, Desor, v. sub. †*B. oblongus*, Wright. *B. imbricatus*, Wright, Upper Coralline Limestone, Malta; GREGORY, (4) p. 619: synonym *B. scillae* (pars) Desor.

†*Brissus depressus*, GREGORY, (4) pp. 620 & 621, pl. ii, fig. 2, Upper Coralline Limestone, Malta, n. sp.

†*Cardiaster granulosus*, Goldf., Cretaceous, Upper Bavaria; BÖHM, p. 98.

†*C. latecordatus*, TATE, pp. 280 & 281, Eocene of Australia; *C. tertiaris*, GREGORY, (1) pp. 484 & 485, pl. xiv, figs. 2 & 3, Tertiary, Willunga, Australia: n. spp.

*Cassidulus*, Lam.: definition of genus; COTTEAU, (1) pp. 54 & 55.

†; *C. aquoreus*, Morton, Cretaceous, Alabama; CLARK, p. 76. *C. amygdala*, Desor, Eocene of Callosa and Orchesta, Alicante; COTTEAU, (1) p. 55. *C. florealis*, Morton, Cretaceous, New Jersey; CLARK, p. 76. *C. micrococcus*, Gabb., Cretaceous, Alabama; *id.* p. 76. *C. subquadratus*, Conrad, Cretaceous, Mississippi; *id.* p. 76.

†; *C. longianus*, GREGORY, (1) p. 481, pl. xiii, figs. 1–3, Tertiary, Willunga, Australia, and recorded from Eocene of Australia, TATE, p. 275; *C. porrectus*, CLARK, p. 76, Cretaceous, Mississippi; *C. stantoni*, *id.* p. 76,

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\* The author's system does not clearly indicate whether this, and many others, be n. sp. or not.

Cretaceous, Colorado; *C. subconicus*, *id.* p. 76, Cretaceous, Mississippi : n. spp.

†; *Catopygus (Studeria) elegans*, Laube, Eocene of Australia; TATE, p. 276. *C. oviformis*, Conrad., Cretaceous, New Jersey; CLARK, p. 76.

† *C. pusillus*, CLARK, p. 76, Cretaceous, New Jersey, n. sp.

*Cidaris*, Klein, definition of genus; COTTEAU, (1) pp. 91 & 92.

†; *C. (Leiocidaris)* sp., Tertiary, Willunga, Australia; GREGORY, (1) p. 481. *C. adamsi*, Wright, Lower Limestone, Malta; *id.* (4) pp. 588 & 589. *C. anglosuevica*, Oppel, v. sub *Rhabdocidaris horrida*, Merian. *C. armiger*, Morton, from Cretaceous of New Jersey; CLARK, p. 75. *C. avenionensis*, Desmoulins, Tertiary of Algeria; COTTEAU, (4) p. 243: Globigerina Limestone, Malta; GREGORY, (4) pp. 587 & 588, pl. i, fig. 1; synonym, *C. stemmacantha*, Ag.: Aquitanian of Carry, near Marseilles; GOURRET, p. 129. *C. bertrandi*, Michelin, v. sub *Diplocidaris gigantea* (Ag.), Desor. *C. blandus*, de Greg., Eocene of Alabama; DE GREGORIO, (2) p. 253, pl. xlv, fig. 4. *C. blumenbachi*, Musset, Jurassic of Portugal; DE LORIO, (3) pp. 18 & 19, pl. iii, figs. 2 & 3. *C. cesaredensis*, de Lor., *ib.*; *id.* (3) pp. 11 & 12, pl. ii, figs. 1-4. *C. choffati*, de Lor., *ib.*; *id.* (3) pp. 29 & 30, pl. v, figs. 3-11. *C. coronata*, Goldf., Jurassic of Hansdorf, near Inowrazlaw; LANGENHAN. *C. cucumifera*, Ag., Jurassic of Portugal; DE LORIO, (3) pp. 3 & 4, pl. i, fig. 1. *C. cymosa*, de Lor., *ib.*; *id.* p. 12, pl. ii, fig. 5. *C. desmoulinsi*, Sismonda, Pliocene of Algeria; COTTEAU, (4) p. 242. *C. drogiaca*, Cott., v. sub *Diplocidaris gigantea* (Ag.), Desor. *C. florigemma*, Phillips, Jurassic of Portugal; DE LORIO, (3) p. 19, pl. iii, figs. 4 & 5. *C. glandifera*, Goldf., *ib.*; *id.* (3) pl. v, figs. 1 & 2, pp. 27-29: from Jurassic of Japan; NAUMANN & NEUMAYR, p. 31.

†; *Cidaris gomesi*, de Lor., Jurassic of Portugal; DE LORIO, (3) pp. 24 & 25, pl. iv, fig. 4, n. sp.? *C. guerangeri*, Cott., *ib.*; *id.* (3) p. 16, pl. ii, figs. 16-18. *C. guimaraesi*, de Lor., *ib.*; *id.* (3) pp. 30 & 31, pl. v, figs. 12-16, n. sp.? *C. guinchoensis*, de Lor., *ib.*; *id.* (3) pp. 25 & 26, pl. iv, figs. 5-8, n. sp.? *C. honorinae*, Cott., *ib.*; *id.* pp. 8 & 9, pl. i, figs. 10-13. *C. hystericoides*, Quenst., Jurassic of Hansdorf, near Inowrazlaw; LANGENHAN. *C. kaechlini*, Cott., Jurassic of Portugal; DE LORIO, (3) p. 13, pl. ii, fig. 6. *C. lineata*, Cott., *ib.*; *id.* (3) p. 20, pl. iii, figs. 6-10. *C. lorioli*, Cott., Eocene, Loire-Inférieure; COTTEAU, (5) p. 155, pl. viii, figs. 20-23. *C. lorteti*, Cott., Jurassic of Portugal; DE LORIO, (3) p. 6, pl. i, figs. 5 & 6. *C. loulensis*, de Lor., *ib.*; *id.* (3) p. 27, pl. iv, figs. 10 & 11. *C. marginata*, Goldf., *ib.*; *id.* (3) pp. 21 & 22, pl. iii, figs. 11-17. *C. mattosensis*, de Lor., *ib.*; *id.* (3) p. 15, pl. ii, figs. 12 & 13. *C. maximus*, Munst (pars), v. sub *Rhabdocidaris horrida*, Merian. *C. meandrina*, Ag., Jurassic of Portugal; DE LORIO, (3) p. 14, pl. ii, figs. 7-11. *C. melitensis*, Wright, Upper Coralline Limestone, Malta; GREGORY, (4) pp. 586 & 587. *C. modestus*, de Greg., Eocene of Alabama; DE GREGORIO, (2) p. 253, pl. xliii, fig. 26. *C. morens*, de Greg., *ib.*; *id.* (2) p. 252, pl. xliii, figs. 22 & 23. *C. nevesensis*, de Lor., Jurassic of Portugal; DE LORIO, (3) p. 23, pl. iii, fig. 18, n. sp.? *C. ordinatus*, de Greg., Eocene of Alabama; DE

GREGORIO, (2) p. 252, pl. xlv, fig. 1. *C. panasqueirensis*, de Lor., Jurassic of Portugal; DE LORIO, (3) pp. 26 & 27, pl. iv, fig. 9, n. sp.? *C. palliata*, de Lor., *ib.*; *id.* (3) p. 10, pl. i, fig. 14. *C. penichensis*, de Lor., Jurassic of Portugal; DE LORIO, (3) p. 7, pl. i, figs. 8 & 9, n. sp.? *C. perdubius*, de Greg., Eocene of Alabama; DE GREGORIO, (2) p. 253, pl. xlv, fig. 2. *C. prænobilis*, Quenst., v. sub. *Rhabdocidaris horrida*, Merian. *C. prionipleura*, Pomel, Pliocene of Algeria; COTTEAU, (4) p. 244. *C. pseudodiadema*, Lam., v. sub. *Pseudodiadema hemisphaericum* (Ag.), Desor. *C. pseudohystrix*, Pomel, Pliocene of Algeria; COTTEAU, (4) pp. 244 & 245. *C. pungens*, Pomel, *ib.*; *id.* (4) p. 241. *C. pustulifera*, Ag., v. sub. *Diplocidaris gigantea* (Ag.), Desor. *C. quaiosensis*, de Lor., Jurassic of Portugal; DE LORIO, (3) p. 7, pl. i, fig. 7, n. sp.? *C. reussi*, Gein., *C. vesiculosa*, Goldf., and *C. sp. indet.*, Cretaceous, N. Bohemia; JAHN, p. 481. *C. sagresensis*, de Lor., Jurassic of Portugal; DE LORIO, (3) p. 17, pl. iii, fig. 1, n. sp.? *C. sahelensis*, Pomel, Pliocene of Algeria; COTTEAU, (4) pp. 239-241. *C. schmidlini*, Desor, a synonym of *C. meandrina*, Ag.; DE LORIO, (3) p. 14. *C. scilla*, Wright, Globigerina Limestone, Malta; GREGORY, (4) p. 587. *C. serrata*, Desor, from Cretaceous of Upper Bavaria; BÜHM, p. 96: from Michery, north of Pont-sur-Yonne, "Craie à belemnites"; GAUTHIER, pp. 75-78, pl. i, figs. 1-10. *C. sp.*; GREGORY, (3) pp. 28 & 29, Pliocene, England. *C. spinulosa*, Roemer, Jurassic of Portugal; DE LORIO, (3) pp. 5 & 6, pl. i, figs. 3 & 4. *C. stemmacantha*, Ag., v. sub. *C. avenionensis*, Desmoulins. *C. thyrsiger*, de Lor., Jurassic of Portugal; DE LORIO, (3) p. 23, pl. iv, figs. 1-3. *C. tripterygia*, Ag., v. sub. *Rhabdocidaris orbignyana*, Ag. *E. truculenta*, de Lor., Jurassic of Portugal; DE LORIO, (3) pp. 12 & 13, pl. ii, fig. 14, n. sp.? *C. valladensis*, de Lor., *ib.*; *id.* (3) pp. 15 & 16, pl. ii, fig. 15, n. sp.? *C. vesiculosa*, Goldf., Albion Stage, Perte du Rhône; DE LORIO, (2) p. 10: from Cretaceous, Russia; see PIATNITZSKY, pp. 17, 37, & 45. *C. websteri*, for *C. websterianus*, Forbes, Eocene of Great Britain; GREGORY, (3) p. 28. *C. zshokkei*, Desor, Jurassic of Portugal; DE LORIO, (3) pp. 4 & 5, pl. i, fig. 2.

*C. (Porocidaris) purpurata*, Wyv.-Th., and *C. (Dorocidaris) papillata*, Leske, diagnosis and distribution; HOYLE, pp. 404 & 405.

*C. tribuloides*, Lam., from Bahamas; IVES, (2) p. 337.

†; *C.*, n. sp., NAUMANN & NEUMAYR, p. 32, Jurassic, Japan; *C. folcariensis*, GAUTHIER, pp. 82-84, pl. ii, figs. 1-4, Lower Neocomian of Fouchères (Aube); *C. oligocenus*, GREGORY, (4) pp. 589 & 590, pl. i, figs. 2-4, Lower Coralline Limestone, Malta; *C. submarginata*, FELIX, pp. 174 & 175, taf. xxvii, figs. 9-16, 18, 20, & 32, from Upper Jura of Oaxaca, Mexico; *C. texanus*, CLARK, p. 75, Cretaceous, Texas; *C. vilanova*, COTTEAU, (1) pp. 92 & 93, pl. xiv, figs. 9-15, Eocene of Callosa, Alicante; *C. walcotti*, CLARK, p. 75, Cretaceous, New Jersey: n. spp.

† *Circopeltis peroni*, Cott., correction in description; COTTEAU, (6) p. 633.

*Clypeaster*, Lam.: definition of genus; COTTEAU, (1) pp. 86 & 87: definition and affinities of the genus; *id.* (3) pp. 225-228.

†; *C. acclivis*, Pomel, Miocene of Algeria; COTTEAU, (4) pp. 182 & 183. *C. agassizii*, Sismonda, v. sub. *C. altus* (Leske), Lam. *C. alticostatus*, Michelin, Miocene of Algeria; COTTEAU, (4) pp. 210–213. *C. altus* (Walch), Lam., Miocene of Algeria; *id.* (4) pp. 224–228. *C. altus* (Leske), Lam., Greensand, Upper Coralline Limestone, Malta; GREGORY, (4) pp. 593–596: synonyms, *Scutella pyramidalis*, Risso, *Clypeaster portentosus*, Desmoulins, *C. turritus*, Ag., *C. alticostatus*, Michelin, *C. agassizii*, Sismonda, *C. insignis*, Seguenza. *C. atavus*, Pomel, Eocene of France; COTTEAU, (3) pp. 232–234. *C. biarritzensis*, Cott., *ib.*; *id.* (3) pp. 228–231, pl. cclx. *C. confusus*, Pomel, Miocene of Algeria; *id.* (4) pp. 175–177. *C. crassicostatus*, Ag., *C. turritus*, Ag., *C. gibbosus*, Serr., *C. grandiflorus*, Bronn, *C. tauricus*, Desh., and *C. sp. ind.*, from Miocene of Syria; BLANCKENHORN, p. 615, &c. *C. dorma*, Pomel, Miocene of Algeria; COTTEAU, (4) pp. 203–205. *C. ficheuri*, Pomel, *ib.*; *id.* (4) pp. 170–173. *C. folium*, Ag., *ib.*; *id.* (4) pp. 164 & 165: v. sub. *C. marginatus*, Lam. *C. gibbosus* (Risso), de Serres, Greensand, probably not Malta; GREGORY, (4) p. 628. *C. gippslandicus*, McCoy, Tertiary, Murray River, Australia; GREGORY, (1) p. 487: Eocene of Australia; TATE, p. 275. *C. insignis*, Seguenza, v. sub. *C. altus* (Leske), Lam. *C. intermedius*, Desmoulins, Miocene of Algeria; COTTEAU, (4) pp. 180–182. *C. marginatus*, Lam., Greensand, Malta; GREGORY, (4) pp. 596 & 597: synonyms, *C. turbellianus*, Grateloup, *C. folium*, Wright. *C. melitensis*, Michelin, probably from Egypt; GREGORY, (4) p. 628. *C. myriophyma*, Pomel, Miocene of Algeria; COTTEAU, (4) pp. 205–207. *C. obeliscus*, Pomel, *ib.*; *id.* (4) pp. 213–215. *C. pachypleurus*, Pomel, *ib.*; *id.* (4) pp. 222–224. *C. parvituberculatus*, Pomel, *ib.*; *id.* (4) pp. 207–210. *C. peltarius*, Pomel, Tertiary, Algeria; COTTEAU, (4) pp. 169 & 170. *C. pierredoni*, Pomel, Miocene of Algeria; COTTEAU, (4) pp. 187–189. *C. portentosus*, Desmoulins, *ib.*; *id.* (4) pp. 230–234: see also *C. altus* (Leske), Lam. *C. productus*, Miocene of Algeria; COTTEAU, (4) pp. 218–220. *C. reidi*, Wright, probably not from Malta; GREGORY, (4) pp. 627 & 628. *C. rogersi* for *Scutella rogersi*, Morton; DE LORIOI, (2) pp. 10 & 11. *C. scutellatus*, Serres, Tortonian of Carry, near Marseilles; GOURRET, p. 130. *C. scutelliformis*, Pomel, Eocene of France; COTTEAU, (3) pp. 234 & 235. *C. semiglobus*, Grateloup, v. sub. *Echinolampus hemisphaericus* (Lam.), Ag. *C. simoni*, Pomel, Miocene of Algeria; *id.* (4) pp. 183–191. *C. sinus*, Pomel, Pliocene of Algeria; *id.* (4) pp. 173–175. *C. soumatensis*, Pomel, Miocene of Algeria; *id.* (4) pp. 191–193. *C. subacutus*, Pomel, *ib.*; *id.* (4) pp. 228–230. *C. subfolium*, Pomel, *ib.*; *id.* (4) pp. 165–167. *C. subhemisphaericus*, Pomel, *ib.*; *id.* (4) pp. 198–200. *C. tumidus*, Pomel, *ib.*; *id.* (4) pp. 220 & 221. *C. turbellianus*, Grateloup, v. sub. *C. marginatus*, Lam. *C. turritus*, Ag., v. sub. *C. altus* (Leske), Lam. *C. welschi*, Pomel, Miocene of Algeria; COTTEAU, (4) pp. 193–195.

†; *C. bouillei*, COTTEAU, (3) pp. 231 & 232, pl. cclxi, Eocene of France; *C. douvillei*, PERON & GAUTHIER, Miocene of Algeria, see COTTEAU, (4) pp. 215–218; *C. egregius*, *iid.*, *ib.*, see COTTEAU, (4) pp. 195–198; *C.*

*heinzi*, *iid.*, Eocene? of Algeria, see COTTEAU, (4) pp. 200–203; *C. jourdyi*, *iid.*, Pliocene of Algeria, see COTTEAU, (4) pp. 177–179, pl. vii, figs. 1–4; *C. pentadactylus*, *iid.*, Miocene of Algeria, see COTTEAU, (4) pp. 183–187, pl. vi, figs. 4 & 5; *C. solanoi*, Eocene of Callosa, *id.* (1) pp. 87 & 88, pl. xiii, figs. 1–5; *C. subdecagonus*, PERON & GAUTHIER, Tertiary, Algeria, see COTTEAU, (4) pp. 167–169, pl. v, figs. 5–7; *C. vilanova*, Eocene of Callosa, *id.* (1) pp. 88 & 89, pl. xiii, figs. 6–9 : n. spp.

*Clypeastroide* : definition and affinities of the family ; COTTEAU, (3) pp. 224 & 225.

† *Coliopsis jaccardi*, Cott., from Fontenoy ; GAUTHIER, pp. 90–92.

† ; *Celopleurus inflatus*, Mort., Eocene of Alabama ; DE GREGORIO, (2) p. 251, pl. xliii, figs. 27 & 28. *C. paucituberculatus*, n. sp., Eocene of Australia ; GREGORY, (1) pp. 486 & 487, pl. xiv, figs. 4 & 5, and TATE, p. 274. *C. wetherelli*, Forbes, Eocene of Great Britain ; GREGORY, (3) pp. 18 & 19. *C. dixonii*, GREGORY, (3) p. 19, Eocene of Great Britain.

† ; *Collyrites elliptica* (Desmoulins), Lam., Callovian, Portugal ; DE LORIOL, (3) pp. 124 & 125, pl. xxiii, fig. 6. *C. loryi* (A. Gras.), d'Orb., Lusitanian, Portugal ; *id.* (3) pp. 125 & 126, pl. xxiii, fig. 7. *C. ringens* (Desmoulins), Ag., Jurassic, Portugal : synonyms, *Dysaster eudesii*, Desor, *Nucleolites gibbosus*, Münster ; *id.* (3) pp. 123 & 124.

*Conoclypeidæ* : definition and affinities of family ; COTTEAU, (3) pp. 190–195.

*Conoclypeus*, Ag. : definition and affinities of genus ; COTTEAU, (3) pp. 195 & 196, and *id.* (1) p. 81 : list of 18 Eocene species not found in France, with diagnoses ; *id.* (3) pp. 215–224.

† ; *C. anachoreta*, Ag., Eocene of Callosa ; *id.* (1) p. 83. *C. conoideus* (Leske), Ag., *ib.* ; *id.* (1) p. 82, and Eocene of France, *id.* (3) pp. 200–210, pls. cclii–cclvi. *C. lucentinus*, Cott., Eocene of Callosa ; *id.* (1) pp. 85 & 86, pl. xii, figs. 5 & 6. *C. marginatus*, Desor, Eocene of France ; *id.* (3) pp. 196–200, pl. cexlix, fig. 5, pls. ccl & ccli. *C. pyrenaeus*, Cott., *ib.* ; *id.* pp. 210–214, pls. cclvii–cclix.

† ; *C. vilanova*, COTTEAU, (1) pp. 83–85, pl. xi, figs. 4–7, pl. xii, figs. 1–4, Eocene of Callosa ; *C. plagiosomus*, Laube, v. sub. *Heteroclypeus subpentagonalis* : n. spp.

† *Craterolampas*, n. g., COTTEAU, (3) pp. 186–188, = *Echinolampas*, pars. + *C. raulini*, for *Echinolampas raulini*, Cott., Eocene of France ; *id.* (3) pp. 188–190, pl. cexlvi, fig. 1, & pls. cexlvii & cexlviii.

*Cyclaster*, Cott., definition of genus ; COTTEAU, (1) p. 47 : remarks on the genus ; BITTNER, pp. 137 & 138 : nearly related to *Micraster* and distinct from *Brissopsis*. + *C. lucentinus*, Cott., Eocene of Callosa, Alicante ; COTTEAU, (1) pp. 47 & 48, pl. v, figs. 18–22.

*Cyphosoma*, Ag., definition of genus ; COTTEAU, (1) pp. 99 & 100.

† ; *C. aquitanicum*, Cott., from the Neocomian of Puebla, Mexico ; FELIX, p. 163. *C. canali*, Cotteau, from Cretaceous of Upper Bavaria ; BÖHM, p. 97. *C. corollare*, Ag., from Cretaceous of Upper Bavaria ; *id.* p. 97, taf. iv, figs. 13 a & b. *C. ribeiroi*, de Lor., Jurassic of Portugal ; DE LORIOL, (3) pp. 92 & 93, pl. xvi, fig. 1 : [n. sp.].

† ; *C. illoreæ*, COTTEAU, (1) pp. 103 & 104, pl. xvi, figs. 12-16 ; *C. originale*, Eocene of Alfàz, *id.* (1) pp. 102 & 103, pl. xvi, figs. 7-11 ; *C. (Coptosoma) singulare*, from Cretaceous of Upper Bavaria, BÖHM, pp. 96 & 97, taf. iv, figs. 15 a-c ; *C. speciosum*, Cretaceous of New Jersey, CLARK, p. 76 ; *C. vilanovæ*, Eocene of Alfàz, COTTEAU, (1) pp. 100 & 101, pl. xvi, figs. 1-6 : n. spp.

† *Desorella jurensis*, Etallon, v. sub. *Pyrina icauensis* (Cott.), de Lor.

† ; *Diadema bruntrutatum*, Ag. & Desor, v. sub. *Pseudodiadema conforme* (Ag.), Etallon. *D.*, cf. *Desori*, Rss., Tertiary of Saxony ; FUTTERER, pp. 12 & 13, fig. 4. *D. icauensis*, Cott., v. sub. *Phymechinus mirabilis* (Ag.), Desor.

*D. setosum*, Gray, from Japan ; IVES, (1) p. 214.

† ; *Diplocidaris desipiens*, de Lor., Jurassic of Portugal ; DE LORIOI, (3) p. 48, pl. ix, fig. 3. *D. gigantea*, (Ag.) Desor, synn. *Cidaris pustulifera*, Ag., *C. drogiaca*, Cott., *C. bertrandi*, Michelin, *ib.* ; *id.* (3) pp. 46 & 47, pl. viii, figs. 27-31. *D. guinchoensis*, de Lor., *ib.* ; *id.* (3) pp. 47 & 48, pl. ix, figs. 1 & 2 : [n. sp. ?] *D. heuvelini*, Cott. & Triger, v. sub. *Rhabdocidaris horrida*, Merian. *D. verrucosa*, Gauthier, Jurassic of Portugal ; DE LORIOI, (3) pp. 44 & 45, pl. viii, figs. 13-26.

† *Diplopodia planissima*, (Ag.) Et., Jurassic of Portugal ; DE LORIOI, (3) pp. 87 & 88, pl. xv, fig. 11.

*Dipneustes*, Arnaud : diagnosis and remarks on ; COTTEAU, (6) pp. 623 & 624. † *D. aturicus*, Arnaud, Garumnian of Landes ; *id.* (6) pp. 624-626, pl. xviii, figs. 11-13.

*Ditremaster*, Munier-Chalmas, definition of genus ; COTTEAU, (1) pp. 44 & 45. † *D. nux*, Munier-Chalmas, Eocene of Confrides, Callosa, and Orcheta, Alicante ; *id.* (1) p. 45.

*Dorocidaris papillata* (Leske), Ag., S.W. Coast of Ireland, 345 faths. ; SLADEN, (1) p. 699 [v. sub. *Cidaris*].

† *Dysaster eudesii*, Desor, v. sub. *Collyrites ringens* (Desmoulin), Ag.

*Echinanthus*, Breyn : definition of genus ; COTTEAU, (1) p. 58.

† ; *E. corsicus*, Cott., Tortonian of Carry, near Marseilles ; GOURRET, p. 130 : v. sub. *Breynella vasalli*, Wright sp. *E. dorsalis*, Cott., Eocene of Callosa ; COTTEAU, (1) pp. 61 & 62, pl. vii, figs. 10-13. *E. hispanicus*, Eocene of Callosa, Alicante ; *id.* (1) p. 59, pl. vii, figs. 1-4. *E. issyaviensis* (Klein), Munier-Chalmas, Eocene of Loire-Inférieure ; *id.* (5) pp. 137 & 138, pl. vi, figs. 7-10. *E. minor*, Cott., Eocene of Callosa ; *id.* (1) pp. 63 & 64, pl. viii, figs. 5-9. *E. stelliferus*, Cott., Eocene of Callosa ; *id.* (1) pp. 60 & 61, pl. vii, figs. 5-9. *E. subcarinatus*, Goldf., Upper Oligocene of Doberg ; LIENENKLAUS, p. 137.

*E. rosaceus*, L., from Bahamas ; IVES, (2) p. 337. *E. testudinarius*, Gray, from Japan ; IVES, (1) p. 214.

† *E. vidali*, COTTEAU, (1) pp. 62 & 63, pl. viii, figs. 1-4, Eocene of Callosa, n. sp.

*Echinarachinus mirabilis*, Ag., from Japan ; IVES, (1) p. 215.

† *Echinobrissus australiæ*, Dunc., Eocene of Australia ; TATE, p. 276.

† ; *E. alemquerensis*, Lusitanian, Portugal, p. 118, pl. xxiii, fig. 5 ; *E.*



*arsenensis*, Jurassic, Portugal, p. 119, pl. xxii, fig. 4, DE LORIOI (3); *E. expansus*, Cretaceous, Alabama, CLARK, p. 76; *E. lusitanicus*, Jurassic, Portugal, DE LORIOI, (3) p. 120, pl. xxiii, figs. 3 & 4; *E. texanus*, Cretaceous, Texas, CLARK, p. 76; *E. vincentinus*, Eocene of Australia, TATE, p. 280 : n. spp.

*Echinocardium cordatum*, Penn., *E. pennatifidum*, Norman, and *E. flavescens*, O. F. M., diagnosis and distribution; HOYLE, pp. 426-429.

†; *E. cordatum*, Penn., Pliocene, Yorkshire; GREGORY, (2) p. 42: Pliocene of Great Britain; *id.* (3) pp. 43 & 44. *E. sp.*, Glacial Series, Great Britain; *id.* (3) pp. 45 & 46. *E. sp.* from Post-Glacial, Great Britain; *id.* (3) p. 46.

†; *Echinocorys douvillei*, Seunes, pp. 25 & 26, pl. ii, figs. 1a, b, *E. heberti*, Seunes, pp. 26-28, pl. iii, fig. 3, pl. iv, fig. 2, and fig. 3 in the text, Cretaceous, Pyrenees; SEUNES. *E. pyrenaicus*, Seunes, Danian of Landes; COTTEAU, (6) pp. 622 & 623, pl. xviii, figs. 9 & 10. *E. vulgaris*, Breyn., from Cretaceous, Upper Bavaria; BÖHM, p. 98.

*Echinocyamus*: the genus should be restricted to the following species: *E. craniolaris*, Leske, *E. australis*, Desmoulins, and *E. volva*, Ag., living; †*E. lorioli*, Gauthier, Eocene, and †*E. subglobosus*, Goldf., Danian. The following species constitute the subgenus *Thagastea*, Pomel: †*E. wetterlei*, Pomel, †*E. luciani*, de Loriol, and †*E. nummuliticus*, Dunc., Eocene; LAMBERT (1) (*vide* also *Fibularia*).

*E. pusillus*, O. F. M., diagnosis and distribution; HOYLE, pp. 419 & 420.

†; *E. boettgeri*, Ebert, Upper Oligocene of Doberg; LIENENKLAUS, p. 137. *E. cambonensis*, Cott., Eocene, Loire-Inférieure; COTTEAU, (5) pp. 150 & 151. *E. hispidulus*, Forbes, a synonym of *E. pusillus* (O. F. M.), Gray; GREGORY, (3) p. 36. *E. huxleyanus*, Mey., Eocene of Alabama; DE GREGORIO, (2) p. 251, pl. xliii, fig. 15. *E. meridionalis*, Mey., *ib.*; *id.* (2) p. 251, pl. xliii, figs. 13 & 14. *E. ovatus*, v. Münst., v. Münster, Upper Oligocene of Doberg; LIENENKLAUS, p. 137. *E. oviformis*, Forbes, a synonym of *E. pusillus* (O. F. M.), Gray; GREGORY, (3) p. 36. *E. pliocenicus*, Pomel, Pliocene of Algeria; COTTEAU, (4) pp. 162 & 163. *E. pusillus*, Pliocene of Yorkshire; GREGORY, (2) p. 42: Pliocene of Great Britain; *id.* (3) pp. 36 & 37: Post-Glacial; *id.* p. 46. *E. studeri* (Sismonda), Ag. & Desor, Globigerina Limestone, Malta; *id.* (4) pp. 592 & 593, pl. i, figs. 8-10. *E. suffolciensis*, Ag., a synonym of *E. pusillus* (O. F. M.), Gray; *id.* (3) p. 36.

†*E. dumasi*, pp. 151-153, pl. viii, figs. 10-14, *vasseuri*, pp. 153 & 154, pl. viii, figs. 15-19, Eocene of Loire-Inférieure, COTTEAU (5) : n. spp.

†*Echinodiscus sampsoni*, n. sp., MILLER, (4) p. 76, pl. xii, fig. 16, Keokuk Group, Missouri.

†*E. subrotundus*, Leske, v. sub. †*Scutella striatula*, M. de Serres.

*Echinolampas*, Gray, definition of genus; COTTEAU, (1) pp. 68 & 69, and (3) pp. 5-9: list of species and their distribution; *id.* (2): list of 65 Eocene species not found in France, with diagnoses; *id.* (3) pp. 136-177.

†; *Echinolampas affinis* (Goldf.), Ag., Eocene of France; *id.* (3) pp. 18-27, pl. cciv, fig. 6, & pl. ccv. *E. algirus*, Pomel, Pliocene of Algeria; *id.* (4) pp. 155 & 156. *E. archiaci*, Cott., Eocene of France; *id.* (3) pp. 39-43, pls. cexi & cexii. *E. arthonensis*, Cott., *ib.*; *id.* (3) pp. 32-34, pl. ccviii, and Eocene, Loire-Inférieure; *id.* (5) p. 139, pl. vii, fig. 1. *E. ataxensis*, Cott., *ib.*; *id.* (3) pp. 80-82, pl. ccxxvi. *E. berticheresensis*, Cott., *ib.*; *id.* (3) pp. 16-18, pl. cciv, figs. 1-5. *E. biarritzensis*, Cott., *ib.*; *id.* (3) pp. 105-109, pl. cclxv. *E. blaviensis*, Cott., *ib.*; *id.* (3) pp. 63-66, pls. ccxx & ccxxi. *E. bouillei*, Cott., *ib.*; *id.* (3) pp. 103-105, pl. ccxxxiv. *E. calvimontanus* (Klein), de Loriol, *ib.*; *id.* (3) pp. 10-16, pls. ccii & cciii. *E. cepa*, Thomas & Gauthier, *ib.*; *id.* (3) pp. 132-134, pl. cclxix, figs. 1-4. *E. complanatus*, Ag., from Miocene of Syria; BLANKENHORN, p. 615, &c. *E. costatus*, Pomel, Miocene of Algeria; COTTEAU, (4) pp. 153-155. *E. delbosi*, Eocene of France; *id.* (3) pp. 113 & 114. *E. depressa*, Manzoni, v. sub. *E. manzoni*, n. sp. *E. deshayesi*, Wright, v. sub. *E. wrighti*, n. sp. *E. discus*, Desor, Eocene of Callosa; COTTEAU, (3) pp. 70 & 71. *E. domus*, Pomel, Miocene of Algeria; *id.* (4) pp. 142-145. *E. dorsalis*, Ag., Eocene of France; *id.* (3) pp. 34-39, pls. ccix & ccx. *E. douvillei*, Cott., *ib.*; *id.* (3) pp. 44-46, pl. cexiii, figs. 1 & 2. *E. ellipsoidalis*, d'Archiac, *ib.*; *id.* (3) pp. 97-102, pls. ccxxxii & ccxxxiii. *E. florescens*, Pomel, *ib.*; *id.* (3) pp. 114-117, pls. ccxxxvii & ccxxxviii, figs. 1 & 2. *E. francei*, Desor, *ib.*; *id.* (3) pp. 27-32, pls. ccvi & ccvii, and Loire-Inférieure; *id.* (5) p. 140, pl. vii, figs. 2-5. *E. gambieriensis*, Tenison-Woods, Eocene of Australia; TATE, p. 276. *E. goujoni*, Pomel, Eocene of France; COTTEAU, (3) pp. 129-132, pl. cclxii, figs. 3-6, & pl. cclxiii. *E. hauchecornei*, Ebert, Upper Oligocene of Doberg; LIENENKLAUS, p. 138. *E. hayesianus*, Desor, Globigerina Limestone; GREGORY, (4) pp. 608 & 609. *E. hayesiana*, Desor, Pliocene of Algeria; COTTEAU, (4) pp. 152 & 153. *E. hayesianus*, Wright, v. sub. *E. wrighti*, n. sp. *E. heberti*, Cott., Eocene of France; *id.* (3) pp. 50-53, pl. ccxiv, figs. 2 & 3, & pl. ccxv. *E. hemisphaericus* (Lam.), Ag., Upper Coralline Limestone, Malta; GREGORY, (4) pp. 605 & 606: synonyms, *E. linkii*, Goldf., *Clypeaster semiglobus*, Grateloup. *E. (Pygurus) hoffmanni* (Lam.), Des., Post-Pliocene of Balestrate; DE GREGORIO, (1) pp. 210-212. *E. kleinii*, Goldf., Upper Oligocene of Doburg; LIENENKLAUS, p. 138, and probably from Sicily; GREGORY, (4) p. 629. *E. laurillardi*, Wright, v. sub. *E. manzoni*, n. sp. *E. lespereensis*, Cott., Eocene of France; COTTEAU, (3) pp. 71-73, pl. ccxxiii, figs. 1-3. *E. leymeriei*, Cott., *ib.*; *id.* (3) pp. 84-88, pl. ccxxvii, figs. 4 & 5, & pl. ccxxviii, figs. 1-4. *E. linderi*, Cott., *ib.*; *id.* (3) pp. 66-68, pl. ccxxii, figs. 1-3. *E. linkii*, Goldf., v. sub. *E. hemisphaericus* (Lam.), Ag. *E. maresi*, Peron & Gauthier, Eocene of France; COTTEAU, (3) pp. 121-123, pl. ccxxxix, figs. 6 & 7. *E. nicaisi*, P. & G., *ib.*; *id.* (3) pp. 123-126, pl. ccxl. *E. nucleus*, Math., *ib.*; *id.* (3) pp. 69-71, pl. ccxxii, figs. 4-11. *E. obesa*, Bittn., 1880, is not identical with *E. obesa*, Dunc. & Sl. 1884, the latter species must therefore be renamed; BITTNER, p. 142. *E. ovalis*, Desmoul., Eocene of Callosa and Alfáz, Alicante;

COTTEAU, (1) p. 69 : Eocene of France; *id.* (3) pp. 53-58, pl. ccxvi & ccxvii. *E. ovulum*, Laube, Tertiary, Willunga, Australia; GREGORY, (1) p. 483, pl. xiii, figs. 7 & 8. *E. perrieri*, de Loriol, Eocene of France; COTTEAU, (3) pp. 126-129, pls. ccxli & ccxlii, figs. 1 & 2. *E. planulatus*, Ebert., Upper Oligocene of Doberg; LIENENKLAUS, p. 139. *E. politus* (Lam.), Desmoul., Eocene of Callosa; COTTEAU, (1) p. 71, and Eocene of France; *id.* (3) pp. 46-49, pl. ccxiii, figs. 3 & 4, & pl. ccxiv, fig. 1. *E. richardi*, Wright, v. sub. *E. manzoni*, n. sp. *E. scutiformis*, Wright, v. sub. *E. posterolatus*, n. sp. *E. silensis*, de Lor., Eocene of Callosa and Alfàz; COTTEAU, (1) pp. 72 & 73. *E. similis*, Ag., Eocene of France; *id.* (3) pp. 73-80, pl. ccxxiii, figs. 4-6, & pls. ccxxiv & ccxxv. *E. soumatensis*, Pomel, Miocene of Algeria; *id.* (4) pp. 150-152. *E. stelliferus* (Lam.), Desmoul., Eocene of France; *id.* (3) pp. 58-62, pls. ccxviii & ccxix. *E. subcylindricus*, Desor, Eocene of Callosa; *id.* (1) pp. 69 & 70. *E. subhemisphaericus*, Pomel, Miocene of Algeria; *id.* (4) pp. 145-148. *E. subsimilis*, d'Archiac, Eocene of France; *id.* (3) pp. 88-94, pl. ccxxviii, fig. 5, & pls. ccxxix & ccxxx. *E. suessi*, Laube, Eocene of Callosa; *id.* (1) pp. 71 & 72. *E. sulcatus*, Pomel, Eocene of France; *id.* (3) pp. 118-121, pl. ccxxviii, figs. 3-6, pl. ccxxxix, figs. 1-5.

†; *Echinolampas almeræ*, Eocene of Callosa, COTTEAU, (1) pp. 74 & 75, pl. ix, figs. 6 & 7; *E. arnaudi*, Danian of Landes, *id.* (6) pp. 626 & 627, pl. xix, figs. 1-5; *E. benoisti*, Eocene of France, *id.* (3) pp. 94-96, pl. ccxxxi; *E. botellæ*, Eocene of Monovar, Alicante, *id.* (1) pp. 76 & 77, pl. x, figs. 1-3; *E. coquandi*, Eocene of France, *id.* (3) pp. 82 & 83, pl. ccxxvii, figs. 1-3; *E. gracilis*, locality uncertain, *id.* (6) pp. 628 & 629, pl. xix, figs. 6-9; *E. heinzi*, Miocene of Algeria, PERON & GAUTHIER, see COTTEAU, (4) pp. 140-142, pl. iv, figs. 1 & 2; *E. jacquoti*, Eocene of France, COTTEAU, (3) pp. 111 & 112, pl. ccxxvi; *E. linaresi*, Eocene of Monovar, *id.* (1) pp. 77 & 78, pl. x, figs. 4-6; *E. lucentinus*, pp. 78-80, pl. x, figs. 7-9; *E. macphersoni*, pp. 80 & 81, pl. xi, figs. 1-3, Eocene of Callosa, *id.* (1); *E. manzoni*, Globigerina Limestone, GREGORY, (4) p. 606 (synn. *E. richardi*, Wright, *E. laurillardi*, Wright, *E. depressa*, Manzoni); *E. pomeli*, Miocene of Algeria, PERON & GAUTHIER, see COTTEAU, (4) pp. 155 & 156; *E. posterocrassus*, Tertiary, Willunga, Australia, GREGORY (1), pp. 483 & 484, pl. xiii, figs. 4-6, and Eocene of Australia, TATE, p. 276; *E. posterolatus*, Oligocene, Malta, GREGORY, (4) pp. 609 & 610 (syn. *E. scutiformis*, Wright); *E. subrostratus*, Coralline Crag, Suffolk, *id.* (3) pp. 38 & 39; *E. thomasi*, Miocene of Algeria, PERON & GAUTHIER, see COTTEAU, (4) pp. 148-150, pl. iii, figs. 5-7; *E. vidali*, Eocene of Callosa, COTTEAU, (1) pp. 75 & 76, pl. ix, figs. 8-10; *E. vilanovæ*, Eocene of Callosa and Orcheta, *id.* (1) pp. 73 & 74, pl. ix, figs. 1-5; *E. wrighti*, Greensand, Malta (synn. *E. deshayesi*, Wright, *E. hayesianus*, Wright), GREGORY, (4) pp. 607 & 608 : n. spp.

*Echinometra subangularis*, Leske, from Bahamas; IVES, (2) p. 339.

†*Echinoneus thomasi*, PERON & GAUTHIER, Miocene of Algeria, see COTTEAU, (4) pp. 133-135, n. sp.

†*Echinopedina edwardsi*, Forbes, Eocene of Great Britain; GREGORY, (3) pp. 19 & 20.

†*Echinospatangus africanus*, Coquand, Tunis; COTTEAU, (6) p. 622, pl. xviii, figs. 7 & 8.

†; *Echinus algerus*, Pomel, Pliocene of Algeria; COTTEAU, (4) p. 256. *E. alternans*, Quenst., v. sub. *Phymechinus mirabilis* (Ag.), Desor. *E. charlesworthi*, Forbes, Pliocene of Great Britain; GREGORY, (3) pp. 34 & 35. *E. costatus*, Ag., v. sub. *Stirechinus scillæ* (Desmoulins), Desor. *E. dixonii*, for *E. dixonianus*, Forbes, Eocene of Great Britain; GREGORY, (3) p. 28. *E. duciei*, Wright, Upper Coralline Limestone, Malta; *id.* (4) p. 590, pl. i, fig. 6. *E. esculentus*, L., Pliocene of Great Britain; *id.* (3) p. 33: Glacial Lines; *id.* pp. 44 & 45: Post-Glacial; *id.* p. 46. *E. exercens*, De Greg., sp. dub., Eocene of Alabama; DE GREGORIO, (2) p. 252, pl. xlv, fig. 3. *E. henslovi*, Forbes, Pliocene, Yorkshire; GREGORY, (2) p. 40, pl. i, figs. 2-4: Pliocene of Great Britain; *id.* (3) p. 35, pl. ii, figs. 2-4. *E. hungaricus*, Laube, Pliocene, Italy, Malta, and Hungary; *id.* (4) p. 592. *E. lyelli*, Forbes, Pliocene of Great Britain; *id.* (3) p. 34. *E. miliaris*, P. L. S. Müller, Pliocene of Great Britain; GREGORY, (3) pp. 33 & 34: Post-Glacial; *id.* (3) p. 46. *E. sphaera* and *E. neglectus*, from Portrush, Antrim, Ireland; A. BELL, p. 297. *E. spheroides*, Cott., Pliocene, Yorkshire; GREGORY, (2) p. 41, pl. i, figs. 5 & 6: Pliocene of Great Britain; *id.* (3) p. 35, pl. ii, figs. 5 & 6. *E. woodi*, Desor, Pliocene, Yorkshire; *id.* (2) p. 40, pl. i, fig. 8: Pliocene of Great Britain; *id.* (3) p. 34, pl. ii, fig. 8. *E. woodwardi*, Desor, *E. esculentus*, L., *E. miliaris*, Müller, and *E. charlesworthi*, Forbes, from Pliocene, Yorkshire; *id.* (2) p. 39: *E. woodwardi*, Desor, Pliocene of Great Britain; *id.* (3) pp. 32 & 33: Glacial series; *id.* (3) p. 45.

*E. esculentus*, from Largo Bay, Fife; A. BELL, p. 293. *E. esculentus*, L., *acutus*, Lan., *melo*, Lam., *elegans*, Düb. & Kor., *microstoma*, Wyv.-Th., *norvegicus*, Düb. & Kor., and *miliaris*, Müller, diagnosis and distribution; HOYLE, pp. 411-418. *E. microstoma*, Wyv.-Th., and *E. norvegicus*, Düb. & Kor., S.W. Coast of Ireland, 345 faths.; SLADEN, (1) p. 701.

†; *E. paucimiliaris*, Pliocene, Yorkshire, GREGORY, (2) pp. 39 & 40, pl. i, fig. 1, also Pliocene of Great Britain, *id.* (3) p. 35, pl. ii, fig. 1; *E. tongrianus*, Oligocene, Malta, *id.* (4) pp. 591 & 592, pl. i, figs. 7 a-d; *E. tortonicus*, Lower Coralline Limestone, Malta, *id.* (4) pp. 590 & 591, pl. i, figs. 5 a-d: n. spp.

†*Enallaster mexicanus*, Cretaceous of Mexico; HEILPRIN, p. 468.

†; *E. texanus*, Roemer, probably identical with *Spatangus columbianum*, Lea, and *Enallaster peruvianus*, Gabb., Cretaceous, Texas; CLARK, p. 77.

††*Endeodiadema*, n. g.; DE LORIO, (1) p. 343: with diagnosis and remarks on; *id.* (3) p. 90.

†*E. lepidum*, de Lor., Jurassic of Portugal; DE LORIO, (3) pp. 90 & 91, pl. xvi, figs. 2 & 3 [n. sp. ?]

†*Ecoidaris blairi*, n. sp., MILLER, (3) p. 73, pl. xii, figs. 1 & 2, Keokuk Group, Missouri.

†*Epiaster elegans*, Shumard, Cretaceous, Texas; CLARK, p. 77.

†*E. whitei*, n. sp., CLARK, Cretaceous, Texas.

*Euspatangus*, Ag.: definition of genus; COTTEAU, (1) p. 8.

†; *E. acuminatus*, Cott., from Eocene of Finestrat, Alicante; *id.* (1) pp. 8 & 9, taf. i, figs. 4–10. *E. croizieri*, Cott., Eocene, Loire-Inférieure; *id.* (5) p. 129. *E. de konincki*, Wright, Blue Clay and Globigerina Limestone, Malta; GREGORY, (4) p. 624. *E. gibretensis*, Tournouër, Eocene of Villajoyosa, Alicante; COTTEAU, (1) pp. 12 & 13. *E. hastingiae*, Forbes, Eocene of Great Britain; GREGORY, (3) p. 26. *E. laubei*, Dunc., Eocene of Australia; TATE, p. 278. *E. murrayensis*, Laube, Eocene of Australia; *id.* p. 278. *E. parvulus*, Cott., Eocene of Callosa, Alicante; COTTEAU, (1) pp. 11 & 12, pl. i, figs. 15–19. *E. rotundus*, Dunc., Eocene of Australia; TATE, p. 278. *E. vasseuri*, Cott., Eocene of La Vendée; COTTEAU, (5) p. 129. *E. vilanovæ*, Cott., from Eocene, Callosa, Alicante; *id.* (1) pp. 10 & 11, pl. i, figs. 11–14.

†*Euspatangus wrighti*, Laube, Eocene of Australia; TATE, p. 278.

†; *E. decipiens*, Eocene of Australia, TATE, p. 282; *E. excentricus*, Eocene of Great Britain, GREGORY, (3) pp. 26–28, fig. 1 in the text: n. spp.

*Fibularia*: the genus should include the following species—*F. pusilla*, Müller, †*F. sicula*, Ag., †*F. complanata*, Corta, †*F. costa*, Seg., †*F. pliocenica*, Pomel, †*F. suffolciensis*, Forbes, †*F. hispidula*, Forbes, †*F. oviformis*, Forbes, Pliocene; †*F. studeri*, Sism., †*F. declivis*, Pomel, †*F. umbonata*, Pomel, †*F. stricta*, Pomel, Miocene; †*F. ovata*, Münster., †*F. scutata*, Münster., †*F. boettgeri*, Ebert., †*F. zitteli*, Ebert., Oligocene; †*F. alpina*, Ag., †*F. piriformis*, Ag., †*F. subcauda*, Desm., †*F. affinis*, Desm., †*F. attavillensis*, Defr., †*F. inflata*, Defr., †*F. dacica*, Pavay, †*F. lorioli*, Cott., †*F. pomeli*, Cott., †*F. campbonensis*, Cott., Eocene; and †*F. placenta*, Goldf., Danian; these species have hitherto been included in the genera *Echinocyamus*, *Anaster*, *Echinoneus*, and *Scutella*: LAMBERT (1). †*F. gregata*, Tate, Eocene of Australia; TATE, p. 275.

†; *Galerites conoides*, Aradas, v. sub. *Heteroclypeus subpentagonalis*, n. sp.

*Galerolampas*, Cott.: definition and affinities of genus; COTTEAU, (3) pp. 1–3. †*G. sorigneti*, Cott., Eocene of France; *id.* (3) pp. 3–5, pl. cci, figs. 1–6.

†; *Glypticus algarbiensis*, de Lor., Jurassic of Portugal; DE LORIOI, (3) p. 96, pl. xvi, fig. 6. *G. burgundiacus*, Michelin, *ib.*; *id.* (3) pp. 94 & 95, pl. xvi, fig. 5. *G. lusitanicus*, de Lor., *ib.*; *id.* (3) pp. 98 & 99, pl. xvii, figs. 1 & 2. *G. sulcatus* (Goldf.), Ag., *ib.*; *id.* (3) pp. 97 & 98, pl. xvi, fig. 7.

*Goniocidaris biserialis*, Döderlein, from Japan; IVES, (1) p. 214.

†*Goniopygus decoratus*, Desor, from Middle Valangian of Chambotte; PILLET.

†*G. zitteli*, n. sp., CLARK, p. 76, Cretaceous, Texas.

†*Gualtieria heberti*, Vasseur, Eocene of La Vendée and Loire-Inférieure; COTTEAU, (5) p. 132.

↓*Gymnodiadema*, n. g.; DE LORIOI, (1) p. 343, and diagnosis and remarks

on ; *id.* (3) p. 100. † *G. choffati*, de Lor., Jurassic of Portugal, *id.* (3) pp. 100 & 101, pl. xvii, fig. 3, n. sp.

*Hemiaster* : remarks on the genus ; BITTNER, p. 139.

† ; *H. lowerbanki*, Forbes, p. 21, *H. branderi*, n. n., for *H. branderianus*, Forbes, Eocene of Great Britain ; GREGORY, (3) p. 22. *H. cotteaui*, Wright, Globigerina Limestone, Malta ; *id.* (4) pp. 610 & 611. *H. grateloupi*, Wright, v. sub. *Pericosmus coranguinum*, n. sp. *H. humphreysianus*, Meek & Hayden, Cretaceous, Montana ; CLARK, p. 77. *H. ligeriensis*, d'Orb., Cretaceous, N. Bohemia ; JAHN, p. 481. *H. orbignyi*, Desor, Cretaceous, Upper Bavaria ; BÖHM, p. 100. *H. parastatus*, Morton, Cretaceous, New Jersey, CLARK, p. 77. *H. prestwichi*, Forbes, Eocene of Great Britain ; GREGORY, (3) pp. 21 & 22. *H. regulusianus*, d'Orb., Cretaceous, Upper Bavaria ; BÖHM, p. 99. *H. scillæ*, Wright, Globigerina Limestone, Malta ; GREGORY, (4) p. 611. *H. texanus*, Roemer, probably identical with *Periaster australis*, Gabb., Cretaceous, Texas ; CLARK, p. 77. *H. ungula*, Morton, Cretaceous, New Jersey ; *id. ibid.*

† ; *H. californicus*, Cretaceous, California, CLARK, p. 77 ; *H. dalli*, Cretaceous, Texas, *id. ibid.* ; *H. forbesi*, Eocene of Great Britain, GREGORY, (3) pp. 22 & 23 ; *H. galantigensis*, Eocene, Galantiga, near Monte Maggiore, DE LORIOI, (2) pp. 11-13, pl. i, fig. 3 ; *H. incrassatus*, Cretaceous, New Jersey, CLARK, p. 77 ; *H. planedeclevis*, Tertiary, Murray River, Australia, GREGORY, (1) p. 488, pl. xiv, figs. 6 & 7, and Eocene of Australia ; TATE, p. 277 ; *H. vadosus*, Globigerina Limestone, Malta, *id.* (4) pp. 611 & 612, pl. ii, figs. 6 a-d : n. spp.

† ; *Hemicidaris agassizii* (Roemer), Dames, Jurassic of Portugal ; DE LORIOI, (3) pp. 70-72, pl. xii, figs. 32 & 33, pl. xiv, figs. 21 & 22 : synonyms, *H. diademata*, Ag., *H. cartieri*, Desor. *H. alemquerensis*, de Lor., Jurassic of Portugal ; *id.* (3) p. 79, pl. xiii, figs. 17-20 [n. sp. ?]. *H. arrabidenensis*, de Lor., *ib.* ; *id.* (3) pp. 74 & 75, pl. xiv, figs. 3 & 4 [n. sp. ?]. *H. cartieri*, Desor, v. sub. *H. agassizii* (Roemer), Dames. *H. cesaredensis*, de Lor., *ib.* ; *id.* (3) pp. 69 & 70, pl. xii, figs. 29-31 [n. sp. ?]. *H. crenularis* (Lam.), Ag., *ib.* ; *id.* (3) pp. 73 & 74, pl. xiii, figs. 7-9. *H.*, cf. *crenularis*, Ag., from Jurassic, Japan ; NAUMANN & NEUMAYR, p. 32. *H. diademata*, Ag., v. sub. *H. agassizii* (Roemer), Dames. *H. fistulosa* (Quenst.), Desor, Jurassic of Portugal ; DE LORIOI, (3) pp. 72 & 73, pl. xiii, figs. 1-6 : synonym, *H. scolopendra*, Quenst. *H. lusitanicus*, de Lor., *ib.* ; *id.* (3) pp. 76 & 77, pl. xiv, figs. 5-7. *H. mondegrensensis*, de Lor., *ib.* ; *id.* (3) pp. 77 & 78, pl. xiii, figs. 10-16 [n. sp. ?]. *H. pustulosa*, Ag., *ib.* ; *id.* (3) pp. 67 & 68, pl. xiv, fig. 2. *H. scolopendra*, Quenst., v. sub. *H. fistulosa* (Quenst.), Desor. *H. texta*, Desor, a synonym of *Cidaris koechlini*, Cott. ; DE LORIOI, (3) p. 13.

† ; *Heteroclypeus hemisphericus*, Greensand, Malta, GREGORY, (4) pp. 598 & 599, pl. i, fig. 11 a-c ; *H. subpentagonalis*, Greensand, Malta, *id.* (4) pp. 599 & 600 : synonyms, *Conoclypeus plagiosomus*, Laube, *Galerites conoideus*, Aradas : n. spp.

*Hipponoe esculenta*, Leske, from Bahamas ; IVES, (2) p. 337.

† ; *Holaster australis*, Dunc., Eocene of Australia ; TATE, p. 276. *H.*

*cinctus*, Morton, synonymous with *Ananchytes fimbriatus*, Morton, Cretaceous, New Jersey; CLARK, p. 77. *H. simplex*, Shumard, synonymous with *H. comanchesi*, Mascon, Cretaceous, Texas; *id.* p. 77. *H. sp.*? from Lower Turonian of Dracy; GAUTHIER, pp. 93-96, pl. ii, figs. 10 & 11.

†; *Holactypus choffati*, de Lor., Lusitanian, Portugal; DE LORIOI, (3) pp. 111 & 112, pl. xx, figs. 1 & 2 [n. sp. ?]. *H. corallinus*, d'Orb., *ib.*; *id.* (3) pp. 112 & 113, pl. xix, fig. 4. *H. depressus* (Leske), Desor, Callovian, Portugal; *id.* (3) pp. 110 & 111, pl. xix, fig. 3. *H. planetus*, Roemer, Cretaceous, Texas; CLARK, p. 76.

*Homolampas glauca*, n. sp., WOOD-MASON & ALCOCK, (2) p. 441, pl. xvii, from 1644 faths.

*Hypospatangus*, Pomel: definition of genus; COTTEAU, (1) p. 13.

†; *H. lucentinus*, Cott., Eocene of Callosa, Alicante; *id.* (1) pp. 13 & 14, pl. ii, figs. 1-3. *H. menglinii*, Desor, Oligocene, Monte Pulgo; DE LORIOI, (2) pp. 17-20, pl. i, fig. 2.

*Ilarionia*, Dames: definition of genus; COTTEAU, (1) p. 53.

†*I. damesi*, Bittner, Eocene of Alfaz, Alicante; *id.* (1) pp. 53 & 54, pl. vi, figs. 10-15.

†*Jeronia pyrenaica*, Seunes, Cretaceous, Pyrenees; SEUNES, pp. 29 & 30, pl. iii, figs. 1 & 2, and figs. 4 & 5 in the text.

*Laganidae*: definition and affinities of the family, with synopsis of genera; COTTEAU, (3) pp. 248-250.

*Laganum*, Klein: definition and affinities of the genus; COTTEAU, (3) pp. 251 & 252. *L. decagonalis*, Lesson, from Japan; IVES, (1) p. 214.

†*L. sorigneti*, n. sp., COTTEAU, (3) pp. 252-264, figs. 2-8, Eocene of France.

†; *Leiocidaris australis*, Dunc., Eocene of Australia; TATE, p. 274. *L. hemigranosus*, for *Cidaris hemigranosus*, Shumard, Cretaceous, Texas; CLARK, p. 75.

†*Lenita patellaris*, Desor, Eocene, Loire-Inférieure; COTTEAU, (5) pp. 148 & 149, pl. viii, figs. 5-9.

*Linthia*, Merian: definition of genus; COTTEAU, (1) p. 26.

†; *L. antiaustralis*, Tate, Eocene of Australia; TATE, p. 277. *L. heberti* (Cott.), Dames, Eocene of Callosa, Alicante; COTTEAU, (1) pp. 26-28. *L. macphersoni*, Cott., Eocene of Callosa and Confrides, Alicante; *id.* (1) pp. 29 & 30, pl. iii, figs. 14-17. *L. vilanova*, Cott., Eocene of Callosa, Alicante; *id.* (1) pp. 28 & 29, pl. iii, figs. 9-13.

†; *L. arthonensis*, Eocene of Arthon, Loire-Inférieure, COTTEAU, (5) pp. 130 & 131, pl. v, figs. 1-5; *L. tumidula*, Cretaceous, New Jersey, CLARK, p. 77; *L. laubei*, Oligocene, Gran Croce di St. Giovanni Ilarione, DE LORIOI, (2) pp. 13-15, pl. ii, fig. 1: n. spp.

*Lovenia* and *Sarsella*: remarks on the genera; BITTNER, pp. 140-142.

†*L. forbesi*, Tenison-Woods, Eocene of Australia; TATE, p. 282.

*Macropneustes*, Ag.: definition of genus; COTTEAU, (1) p. 20.

*Macropneustes* and *Peripneustes*, remarks on; BITTNER, p. 140: the latter genus must be given up, and its species referred to the former.

† ; *M. breviovius* (Leske), Desor, Eocene of Callosa, Alicante ; COTTEAU, (1) p. 20. *M. hispanicus*, Cott., *ib.* ; *id.* (1) pp. 21 & 22, pl. ii, figs. 14-16.

† *M. integer*, Eocene, Galantiga, near Monte Maggiore, DE LORIOI, (2) pp. 15-17, pl. i, fig. 1, n. sp.

† *Magnosia*, *cf. nodulosa* (Goldf.), Desor, Jurassic of Portugal ; DE LORIOI, (3) pp. 101 & 102, pl. xvii, fig. 4.

*Marelia*, Gray : definition of genus ; COTTEAU, (1) p. 5.

† ; *M. anomala*, Dunc., Eocene of Australia ; TATE, p. 278. *M. grignoniensis* (Desmarest), Cott., Eocene of Great Britain ; GREGORY, (3) p. 26 : Eocene, Loire-Inférieure ; COTTEAU, (5) pp. 128 & 129. *M. hispanica*, Cott., from Eocene of Callosa, Alicante ; COTTEAU, (1) pp. 5 & 6, pl. i, figs. 1-3. *M. nicklesi*, Cott., *ib.* ; *id.* (1) pp. 6 & 7, pl. xii, figs. 7-10.

† *M. subellensis*, pp. 81-83, pl. i, fig. 3, *tenuis*, PERON & GAUTHIER, Miocene, Algeria, in COTTEAU, (4) pp. 79-81, pl. i, fig. 2 : n. spp.

† *Metalia melitensis*, n. sp., GREGORY, (4) pp. 621 & 622, pl. ii, figs. 5a-c, Globigerina Limestone, Malta.

† ; *Micraster archeri*, Tenison-Woods sp., Eocene of Australia ; TATE p. 277. *M. aturicus*, Hebert, from Cretaceous, Pyrenees ; SEUNES, pp. 30-32, pl. iv, fig. 1, pl. v, figs. 1a-e. *M.*, *cf. cortestudinarium*, Cretaceous of Bohemia ; JAHN, p. 481. ? *M. gibbus*, Ag. & Desor, Cretaceous, Upper Bavaria ; BÖHM, p. 98.

† *M. schluteri*, n. sp., BÖHM, p. 99, Cretaceous, Upper Bavaria.

*Microlampas*, Cott. : definition of genus ; COTTEAU, (1) pp. 66 & 67.

† *M. conicus*, Cott., Eocene of Callosa, Alicante ; *id.* (1) pp. 67 & 68, pl. viii, figs. 14-19.

*Micropsis* : definition of genus ; COTTEAU, (1) pp. 94 & 95 : restricted ; BITTNER, pp. 142 & 143. † *M. lusseri*, de Loriol, Eocene of Callosa and Alfaz ; *id.* (1) pp. 95 & 96.

† ; *M. samperi*, Eocene of Callosa, pp. 97 & 98, pl. xv, figs. 7-11, *M. tremadesi*, Eocene of Alfaz, pp. 96 & 97, pl. xv, figs. 3-6, *id.* (1) : n. spp.

† *Milnia decorata*, Haime, v. sub. † *Acrosalenia angularis* (Ag.), Desor.

† *Monodiadema*, n. g. ; DE LORIOI, (1) p. 343 : diagnosis and remarks on ; *id.* (3) p. 58. † *M. cotteaui*, de Lor., Jurassic of Portugal ; *id.* (3) pp. 58 & 59, pl. x, figs. 8-11 : n. sp.

† *Monostychia australis*, Laube, Tertiary, Murray River, Australia ; GREGORY, p. 487 : Eocene of Australia ; TATE, p. 275.

*Neolampas rostellata*, Ag., diagnosis and distribution ; HOYLE, p. 421.

† *Nucleolites gibbosus*, Munst., v. sub. † *Collyrites ringeus* (Desmoulins), Ag.

† *Offaster pillula* (Lam.), Desor, from Clerimoi, N.E. of Sens, Chalk ; GAUTHIER, p. 82, pl. i, fig. 11.

† *Oligopygus costulatus* (Desor), de Loriol, locality uncertain ; COTTEAU, (6) pp. 631 & 632, pl. xix, figs. 15-18.

*Opechinus*, Desor, distinct from *Temnechinus*, Forbes ; GREGORY, (3) p. 29 : both genera transferred to the subfamily *Glyphocyphinae*. † *O. polygonalis*, Pomel, Pliocene of Algeria ; COTTEAU, (4) pp. 122 & 123.

† *Opissaster? bleicheri*, Pliocene of Algeria, pp. 123-125, pl. iii, figs. 2 &



3; †*O. jourdyi*, Pliocene P of Algeria, pp. 125-127, pl. iii, fig. 4, PERON & GAUTHIER, see COTTEAU (4) : n. spp.

*Oriolampas*, Munier-Chalmas : definition of genus ; COTTEAU, (1) p. 51. †*O. lorioli*, Cott., Eocene of Callosa, Alicante ; *id.* (1) p. 52, pl. vi, figs. 6-9.

†*Ortholophus lineatus*, Dunc., Eocene of Australia ; TATE, p. 274.

†*Orthopsis saemanni*, Wright, Jurassic of Portugal ; DE LORIOI, (3) pp. 88 & 89, pl. xv, figs. 12 & 13.

†*Parabrissus pseudoprenaster*, Bittner, description ; BITTNER, pp. 133-136, with a woodcut.

†*Paradoxechinus novus*, Laube, Eocene of Australia ; TATE, p. 274.

†*Peltastes valleti*, de Lor., Jurassic of Portugal ; DE LORIOI, (3) pp. 55 & 56, pl. xiv, fig. 1.

*Pericosmus*, Ag. : definition of genus ; COTTEAU, (1) p. 31.

†; *P. compressus*, Dunc., Tertiary, Willunga, Australia ; GREGORY, (1) p. 485, pl. xiv, fig. 1 : Eocene of Australia ; TATE, p. 277. *P. gigas*, McCoy, Eocene of Australia ; *id.* p. 277. *P. hispanicus*, Cott., Eocene of Callosa, Alicante ; COTTEAU, (1) pp. 32 & 33, pl. iv, figs. 3-5. *P. latus* (Ag.), Ag. & Desor, Globigerina Limestone, Malta ; GREGORY, (4) pp. 613-615 ; syn. †*Schizaster grateloupi*, Sismonda. *P. mayalsi*, Cott., Eocene, Alicante ; COTTEAU, (1) pp. 33 & 34, pl. iv, figs. 1 & 2. *P. nelsoni*, McCoy, Eocene of Australia ; TATE, p. 277. *P. spatangoides* (Desor), de Loriol, Eocene of Callosa, Alicante ; COTTEAU, (1) pp. 31 & 32.

†; *P. coranguinum*, Globigerina Limestone, Malta : syn. †*Hemiaster grateloupi*, Wright ; GREGORY, (4) p. 615, pl. ii, figs. 3 & 4a, b ; *P. mccoysi* (= *P. compressus*, McCoy), *id.* (1) p. 485 ; *P. soubellensis*, Miocene of Algeria, PERON & GAUTHIER, see COTTEAU, (4) pp. 132 & 133 : n. spp.

*Phormosoma placenta*, Wyv.-Th., diagnosis and distribution ; HOYLE, p. 406. *P. placenta*, Wyv.-Th., and *P. uranus*, Wyv.-Th., S.W. Coast of Ireland, 750 fath. ; SLADEN, (1) p. 711. *P. sp.*, from 188-405 faths. ; WOOD-MASON & ALCOCK, (2) p. 440. *P. uranus*, Wyv.-Th., diagnosis and distribution ; HOYLE, pp. 406 & 407.

†*Phymechinus mirabilis* (Ag.), Desor, Jurassic of Portugal ; DE LORIOI, (3) pp. 108 & 109, pl. xix, fig. 2 : syn. †*Diadema icaense*, Cott., †*Echinus alternans*, Quenst.

†*Phymosoma radiatum*, Schlüt, Cretaceous, N. Bohemia ; JAHN, p. 481.

†*Pileus hemisphericus* (Ag.), Desor, Lusitanian, Portugal ; DE LORIOI, (3) p. 116, pl. xxii, fig. 1.

†*Pleurodiadema perreiræ*, de Lor., Jurassic of Portugal ; DE LORIOI, (3) pp. 91 & 92, pl. xv, figs. 14 & 15.

*Pliolampas*, Pomel : definition of genus ; COTTEAU, (1) pp. 64 & 65 : definition and affinities ; *id.* (3) pp. 180 & 181. †*P. turreтана*, Thomas & Gauthier, Eocene of France ; *id.* (3) pp. 184-186, pl. ccxlv, figs. 6-9, pl. ccxvi, figs. 1-6. †*P. welschi*, Pomel, Miocene of Algeria ; *id.* (4) pp. 136-138, pl. vi, figs. 1-3.

†; *P. gourdoni*, Eocene of France, COTTEAU, (3) pp. 181-184, pls. ccxliv & ccxlv, figs. 1-5; *P. medfensis*, Miocene of Algeria, PERON & GAUTHIER,

see COTTEAU, (4) pp. 138-140, pl. iv, figs. 3 & 4; *P. vilanora*, Eocene of Callosa, Alicante, COTTEAU, (1) pp. 65 & 66, pl. viii, figs. 10-13 : n. spp.

*Podocidaris primigera*, Ag., from 531 and 1590 faths.; WOOD-MASON & ALCOCK, (2) p. 440.

†*Polycyphus ribeiroi*, de Lor., Jurassic of Portugal; DE LORIOI, (3) pp. 107 & 108, pl. xix, fig. 1.

*Porocidaris gracilis*, n. sp., SLADEN, (1) pp. 699-701, pl. xxix, figs. 1-5, S.W. Coast of Ireland, 750 faths.

*P. sp.* from 405 faths.; WOOD-MASON & ALCOCK, (2) p. 440.

*Pourtalesia miranda*, Ag., *P. jeffreysii*, Wyv.-Th., and *P. phyale*, Wyv.-Th., diagnosis and distribution; HOYLE, pp. 430 & 431.

*Prascutella*, Pomel: definition and affinities of the genus; COTTEAU, (3) pp. 254 & 255. †*P. caillaudi* (Cott.), Pomel, Eocene of France; *id.* (3) pp. 255-259, pls. cclxv & cclxvi, and Eocene of Loire-Inférieure, *id.* (5) pp. 141 & 142, pl. vii, fig. 6.

†*P. degrangei*, n. sp., COTTEAU, (3) pp. 259-261, pl. cclxvii, Eocene of France.

*Prenaster*, Desor, definition of genus; COTTEAU, (1) pp. 45 & 46. †; *P. alpinus*, Desor, Eocene of Callosa, Confrides, and Benidorm, Alicante; *id.* (1) pp. 46 & 47. *P. excentricus*, Wright, Upper Coralline Limestone, Malta; GREGORY, (4) p. 619.

*Prionechinus agassizii*, n. sp., WOOD-MASON & ALCOCK, (2) p. 441, from 1644 and 1888 faths.

*Psammechinus miliaris* (Müller), Ag., S.W. Coast of Ireland, 5 faths.; SLADEN, (1) p. 701.

†; *P. mirabilis*, Laube, from Miocene of Syria; BLANCKENHORN, p. 615, &c. *P. peroni*, Cott., Tertiary, Carry, near Marseilles; GOURRET, p. 129. *P. pusillus*, v. Münt., Upper Oligocene of Doberg; LIENEN-KLAUS, p. 137. *P. rathieri* (Cott.), Desor, from Lower White Neocomian of Bernouil; GAUTHIER, pp. 85-90, pl. ii, figs. 5-7. *P. woodsi*, Laube, Eocene of Australia; TATÉ, p. 274.

†; *P. cingulatus*, CLARK, p. 76, Cretaceous, New Jersey; *P. mustapha*, Pliocene of Algeria, PERON & GAUTHIER, see COTTEAU, (4) pp. 254 & 255, pl. v, figs. 5 & 6; *P. soubellensis*, Miocene of Algeria, *id.*, see COTTEAU, (4) pp. 252-254, pl. v, figs. 1-4 : n. spp.

†; *Pseudocidaris ulhadensis*, de Lor., Jurassic of Portugal; DE LORIOI, (3) pp. 59 & 60, pl. x, fig. 13. *P. choffati*, de Lor., *ib.*; *id.* (3) pp. 63 & 64, pl. xi, fig. 15. *P. gaidensis*, de Lor., *ib.*; *id.* (3) pp. 64 & 65, pl. xi, figs. 16-20. *P. lusitanica*, de Lor., *ib.*; *id.* (3) pp. 61 & 62, pl. xi, figs. 5-13 : synonym, †*P. thurmanni*, Choffat. *P. rupellensis*, Cott., *ib.*; *id.* (3) pp. 60 & 61, pl. xi, figs. 1-4. *P. spinosa*, de Lor., *ib.*; *id.* (3) pp. 66 & 67, pl. xii, fig. 8-28. *P. spissa*, de Lor., *ib.*; *id.* (3) pp. 65 & 66, pl. xii, figs. 1-8.

†*P. thurmanni*, Choffat, v. sub. †*P. lusitanica*, de Lor.

†; *Pseudodiadema conforme* (Ag.), Etallon, Jurassic of Portugal; DE LORIOI, (3) pp. 86 & 87, pl. xv, figs. 8-10 : synonym, †*Diadema bruntrutianum*, Ag. & Desor. *P. hemisphaericum*, Desor (Ag.), *ib.*; *id.* (3) pp. 83-

85, pl. xv, fig. 6: synonym, †*Cidarites pseudodiadema*, Lam. *P. muelense*, de Lor., *ib.*; *id.* (3) pp. 82 & 83, pl. xv, figs. 1-5. *P. orbignyana* (Cott.), Desor, *ib.*; *id.* (3) p. 85, pl. xv, fig. 7. *P. texanum*, for †*Cyphosoma texanum*, Rømer; CLARK, p. 75, Cretaceous, Texas. *P. veronense*, Böhm, Grey Limestone of the South Alps; GLOECKELSTHURN, p. 4.

†; *P. cobelli*, Grey Limestone, South Alps, GLOECKELSTHURN, p. 4, pl. i, figs. 2a-g, & fig. 3a, b; *P. hilli*, Cretaceous, Texas, CLARK, p. 76; *P. rømeri*, for *Diadema texanum*, Rømer, Cretaceous, Texas, CLARK, p. 75; *P. rovedanum*, Grey Limestone, South Alps, GLOECKELSTHURN, p. 5, taf. i, figs. 4a-e: n. spp.

†*Pseudopedina elegans*, n. sp., DE LORIOI, (2) pp. 7 & 8, pl. ii, fig. 3, Étage Rauracien, Berne.

*Pseudopygaulus*, Coquand: definition of genus; COTTEAU, (1) pp. 48 & 49. †*P. lorioli*, Cott., Eocene of Callosa, Alicante; *id.* (1) pp. 49 & 50, pl. vii, figs. 1-5.

†*Pseudosalenia aspera* (Ag.), Etallon, Jurassic of Portugal; DE LORIOI, (3) pp. 56-58, pl. x, fig. 7: synonyms, †*Acrosalenia tuberculosa*, Ag., †*Salenia interpunctata*, Quenst., †*Pseudosalenia flexuosa*, Cott., ? *P. ottmeri*, Dames.

†; *Pygaster umbrella*, Ag., Lusitanian, Portugal; DE LORIOI, (3) p. 115, pl. xxii, fig. 1: synonym, †*P. edwardsaeus*, Buvignier. *P. thomarensis*, de Lor., Jurassic, Portugal; DE LORIOI, (3) pp. 113 & 114, pl. xx, fig. 3.

†*P. algarbiensis*, n. sp., DE LORIOI, (3) pp. 114 & 115, pl. xix, fig. 5, Jurassic, Portugal.

*Pygorhynchus*, Ag.: definition of genus; COTTEAU, (1) p. 55.

†; *P. botellæ*, Cott., Eocene of Callosa; COTTEAU, (1) pp. 57 & 58, pl. vi, figs. 22 & 23. *P. desnoyersi*, Desor, Eocene, Loire-Inférieure; *id.* (5) p. 135, pl. vi, figs. 1 & 4. *P. gregoirei*, Cott., *ib.*; *id.* (5) p. 136, pl. vi, fig. 5. *P. montesinosi*, Cott., Eocene of Callosa, Alicante; *id.* (1) pp. 56 & 57, pl. vi, figs. 16-21. *P. vassali*, Wright, Eocene of Australia; TATE, p. 275.

*Pygospatangus*, Cott.: definition of genus; COTTEAU, (1) p. 17. †*P. salcæ*, Cott., Eocene of Callosa, Alicante; *id.* (1) pp. 17 & 18, pl. xiv, figs. 1-3.

†; *Pygurus blumenbachii* (Koch & Dunker), Ag., Lusitanian, Portugal; DE LORIOI, (3) pp. 120 & 121, pl. xxii, figs. 2 & 3: synonym, †*P. rogerianus*, Cott. *P.* (?) *geometricus*, Morton, Cretaceous, Delaware; CLARK, p. 77. *P. hausmanni* (Koch & Dunker), Ag., Lusitanian, Portugal; DE LORIOI, (3) pp. 121 & 122, pl. xxiii, fig. 2. *P. rogerianus*, Cott., v. sub. *P. blumenbachii* (Koch & Dunker), Ag.

†; *Pyrina icaensis* (Cott.), de Lor., Lusitanian, Portugal; DE LORIOI, (3) p. 117, pl. xxiv, fig. 1: synonym, †*Desorella jurensis*, Etallon. *P. parryi*, Hall, Cretaceous, Texas; CLARK, p. 76.

*Radiocyphus*, Cott.: definition of genus; COTTEAU, (1) p. 98.

†*R. vilanovæ*, n. sp., COTTEAU, (1) pp. 98 & 99, pl. xv, figs. 12-17, Eocene of Alfaz.

*Rhabdocidaris*, Desor: definition of genus; COTTEAU, (1) p. 93.

†; *Rhabdocidaris antiquata*, Cott. & Triger, v. sub. †*R. horrida*, Merian. *R. arsenoensis*, de Lor., Jurassic of Portugal; DE LORIOI, (3) pp. 43 & 44, pl. viii, figs. 5–12. *R. arrudaensis*, de Lor., *ib.*; *id.* (3) p. 40, pl. vi, figs. 3–4. *R. boccegei*, de Lor., *ib.*; *id.* (3) p. 41, pl. viii, figs. 1–4. *R. clavata*, Desor, v. sub. *R. crassissima*, Cott. *R. crassissima*, Cott., Jurassic of Portugal; DE LORIOI, (3) p. 39, pl. vii, figs. 26–29: synonym, *R. clavata*, Desor. *R. deserta*, Ebert, Upper Oligocene of Doberg; LIENENKLAUS, p. 36. *R. guttata*, Cott., Jurassic of Portugal; DE LORIOI, (3) p. 33, pl. v, fig. 22. *R. horrida*, Merian, *ib.*; *id.* (3), pp. 31 & 32, pl. v, figs. 17–20: synonyms, *Cidarites maximus*, pars, Munst., *Cidarites anglosuevica*, Oppel, *Rhabdocidaris antiquata*, Cott. & Triger, *Diplocidaris hewelini*, C. & T., *Cidarites prænobilis*, Quenst. *R. macroacantha*, Thurm. & Et., v. sub. *R. orbignyana*, Ag. *R. major*, Cott., Jurassic of Portugal; DE LORIOI, (3) pp. 32 & 33, pl. v, fig. 21. *R. mira*, de Lor., *ib.*; *id.* (3) pp. 41 & 42, pl. vi, fig. 18. *R. nobilis*, Zitt., v. sub. †*R. orbignyana*, Ag. *R. orbignyana* (Ag.), Desor, Jurassic of Portugal; DE LORIOI, (3) p. 34, pl. vi, figs. 5–17: synonyms, *Cidarites tripterygia*, Ag., *Rhabdocidaris macroacantha*, Thurm. & Et., *R. nobilis*, Zittel. *R. pereiræ*, de Lor., *ib.*; *id.* (3) pp. 42 & 43, pl. vi, fig. 2. *R. ponechi*, Cott., from Eocene of Sella, Alicante; COTTEAU, (1) pp. 93 & 94. *R. sagresensis*, de Lor., Jurassic of Portugal; DE LORIOI, (3) p. 34, pl. vi, fig. 1.

†*Rhynchopygus woodi* (Forbes), Gregory, Pliocene of Great Britain; GREGORY, (3) pp. 37 & 38.

*Salenia*, Gray: definition of genus; COTTEAU, (1) pp. 89 & 90.

†; *S. granulosa*, Forbes, from Clérimois, N.E. of Sens, and from Michery, Belemnite Chalk; GAUTHIER, pp. 78–82, pl. i, figs. 12 & 13. *S. interpunctata*, Quenst., v. sub. *Pseudosalenia aspera* (Ag.), Desor. *S. tertiaria*, Tate, Eocene of Australia; TATE, p. 274. *S. texana*, Credner, Cretaceous, Texas; CLARK, p. 75.

†; *S. bellula*, Cretaceous, New Jersey, CLARK, p. 75; *S. garciæ*, Eocene of Callosa, Alicante, COTTEAU, (1) pp. 90 & 91, pl. xiv, figs. 4–8; *S. globosa*, Eocene of Australia, TATE, p. 279; *S. tremidula*, Cretaceous, New Jersey, CLARK, p. 75; *S. vilanovæ*, Alicante, Spain, probably Aptian, COTTEAU, (6) pp. 620 & 621, pl. xviii, figs. 1–6: n. spp.

*Sarsella*, Pomel: definition of genus; COTTEAU, (1) p. 15: remarks on the genus; BITTNER, pp. 140–142. †*S. carinata*, Pomel, Eocene of Villajoyosa, Alicante; COTTEAU, (1) pp. 15 & 16, pl. ii, figs. 4–8.

†; *S. anteroalta*, Globigerina Limestone, Malta, GREGORY, (4) pp. 626 & 627, pl. ii, figs. 7 & 8; *S. duncani*, Globigerina Limestone, Malta, *id.* (4) pp. 624 & 625: synn. *Spatangus hoffmanni*, Wright, *S. ocellatus*, Wright: n. spp.

†*Scaptodiadema*, n. g., pp. 4 & 5, †*S. matheyi*, n. sp., Jurassic of Switzerland and France, pp. 5 & 6, pl. ii, fig. 2; DE LORIOI (2).

*Schizaster*, Ag.: definition of genus; COTTEAU, (1) p. 34. *S. fragilis*, Düb. & Kor., distribution and diagnosis; HOYLE, pp. 421 & 422. *S. japonicus*, Ag., from Japan; IVES, (1) p. 215.

†; *S. archiaci*, Cott., Eocene of Loire-Inférieure; COTTEAU, (5) pp. 132 & 133. *S. canaliferus*, Grateloup, v. sub. *S. scillæ* (Desmoulins), Ag. & Desor. *S. corneti*, Cott., Eocene of Great Britain; GREGORY, (3) p. 24. *S. degrangei*, Cott., Eocene, Callosa; COTTEAU, (1) p. 36. *S. desori*, Wright, Globigerina Limestone, Malta; GREGORY, (4) p. 617. *S. d'urbani*, Forbes, Eocene of Great Britain; *id.* (3) p. 24. *S. eurynotus*, Ag., v. sub. *S. scillæ* (Desmoulins), Ag. & Desor. *S. globulus*, Dames, Eocene of Orcheta, Alicante; COTTEAU, (1) p. 38. *S. goldfussi*, Ag., v. sub. *S. parkinsoni* (Defrance), Ag. & Desor. *S. grateloupi*, Sismonda, v. sub. *Pericosmus latus* (Ag.), Ag. & Desor. *S. maurus*, Pomel, Pliocene of Algeria; COTTEAU, (4) pp. 118-120. *S. parkinsoni* (Defrance), Ag. & Desor, Globigerina Limestone, Malta; GREGORY, (4) pp. 616 & 617: synn. *S. goldfussi*, Ag., *S. raulini*, Ag. & Desor. *S. pyrenaicus*, Munier-Chalmas, Eocene of Alfàz, Alicante; COTTEAU, (1) pp. 36-38, pl. iv, figs. 6-9. *S. raulini*, Ag. & Desor, v. sub. *S. parkinsoni* (Defrance), Ag. & Desor. *S. rimosus*, Desor, Eocene of Callosa, Alicante; COTTEAU, (1) p. 35. *S. samperi*, Cott., Eocene of Alfàz and Orcheta; *id.* (1) pp. 40 & 41, pl. v, figs. 1-4. *S. scillæ* (Desmoulins), Ag. & Desor, Upper Coralline Limestone, Malta; GREGORY, (4) pp. 617 & 618: syn. *S. canaliferus*, Grateloup, *S. eurynotus*, Ag. *S. sahelensis*, Pomel, Pliocene of Algeria; COTTEAU, (4) pp. 111-113. *S. scillæ*, Ag., Miocene of Algeria; *id.* (4) pp. 109-111: Tortonian of Carry, near Marseilles; GOURRET, p. 130. *S. sp.* from Miocene of Syria; BLANCKENHORN, p. 615. *S. speciosus*, Pomel, Tertiary of Algeria; COTTEAU, (4) pp. 116-118. *S. studeri*, Ag., Eocene of Callosa; *id.* (1) pp. 35 & 36. *S. vicinalis*, Ag., *ib.*; *id.* (1) pp. 34 & 35. *S. vilanovæ*, Cott., Eocene of Alfàz, Orcheta, and Callosa; *id.* (1) pp. 38-40, pl. iv, figs. 10-13.

†; *S. abductus*, Eocene of Australia, TATE, pp. 281 & 282; *S. boghariensis*, Miocene (?) of Algeria, PERON & GAUTHIER, see COTTEAU, (4) pp. 103-105, pl. ii, figs. 6-8; *S. cuneatus*, Eocene of Great Britain, GREGORY, (3) pp. 24-26, pl. i, figs. 1-3; *S. dumasi*, Eocene, Loire-Inférieure, COTTEAU, (5) pp. 133 & 134, pl. v, figs. 6-11; *S. hardouini*, Pliocene of Algeria, PERON & GAUTHIER, see COTTEAU, (4) pp. 113-115, pl. iii, fig. 1; *S. postalensis*, BITTNER, p. 140, n. n. for *S. laubei*, Bittner, which name is preoccupied; *S. pusillus*, Miocene of Algeria, PERON & GAUTHIER, see COTTEAU, (4) pp. 107-109, pl. ii, figs. 10-12; *S. sebtensis*, *ib.*, *id.* (4) pp. 105-107, pl. ii, fig. 9: n. spp.

*Scutella*, Lam.: definition and affinities of the genus; COTTEAU, (3) pp. 239 & 240.

†; *S. crustuloides*, Mort., Eocene of Alabama; DE GREGORIO, (2) p. 251, pl. xliii, figs. 24 & 25. *S. lyelli*, Contr., *ib.*; *id.* (2) p. 250, pl. xliii, fig. 21. *S. obliqua*, Pomel, Miocene of Algeria; COTTEAU, (4) pp. 159 & 160. *S. paulensis*, Ag., Tortonian of Carry, near Marseilles; GOURRET, p. 130. *S. pyramidalis*, Risso, *vide Clypeaster altus* (Leske), Lam. *S. (Mortonia) rogersi* (Mort.), Contr., Eocene of Alabama; DE GREGORIO, (2) p. 250, pl. xliii, figs. 16-20. *S. rogersi*, Morton, to be *Clypeaster rogersi*; DE LORIOI, (2) pp. 10 & 11. *S. striatula*, Marcel de Serres,

Eocene of France ; COTTEAU, (3) pp. 240-242, pl. cclxii : Oligocene, Malta ; GREGORY, (4) pp. 597 & 598 : syn. †*Echinodiscus subrotundus*, Leske. *S. sublevis*, Pomel, Eocene of France ; COTTEAU, (3) pp. 246-248. *S. subrotunda*, Lam., from Miocene of Syria ; BLANCKENHORN, p. 615, &c. *S. subtetragona*, de Grateloup, Eocene of France ; COTTEAU, (3) pp. 243-246, pls. cclxlii & cclxiv, fig. 1.

*Scutellide* : definition and affinities of the family, with synopsis of the genera ; COTTEAU, (3) pp. 236-238.

† ; *Scutellina besanconi*, Cotteau, Eocene of France ; COTTEAU, (3) cclxxxiii, figs. 6-15. *S. blaviensis*, Cott., *ib.* ; *id.* (3) pl. cclxxxiii, figs. 15-21. *S. borrisseoti*, Cott., *ib.* ; *id.* (3) pl. cclxxxii, figs. 1-6. *S. dufouri*, Cott., *ib.* ; *id.* (3) pl. cclxxviii, figs. 11-15. *S. folium*, Cott., *ib.* ; *id.* (3) pl. cclxxxiv, figs. 1-6. *S. incisa* (Defr.), Cott., *ib.* ; *id.* (3) pl. cclxxxi. *S. lenticularis* (Lam.), Ag., Eocene of Great Britain ; GREGORY, (3) p. 20 : and Eocene of France ; COTTEAU, (3) pl. cclxxix, figs. 11-15, & pl. cclxxx. *S. linderi*, Cott., *ib.* ; *id.* (3) pl. cclxxix, figs. 1-9. *S. michilini* (Cott.), Noetling, *ib.* ; *id.* (3) pl. cclxxvii, figs. 6-14, & pl. cclxxviii, figs. 1-10 : and Eocene, Loire-Inférieure ; *id.* (5) pp. 145 & 146, pl. vii, figs. 10-13. *S. obovata*, Ag., Eocene of France ; *id.* (3) pl. cclxxxii, figs. 7-19, & pl. cclxxxiii, figs. 1-5. *S. rotundum* (Galeotti), Forbes, *ib.* ; *id.* (3) pl. cclxxxiv, figs. 7-21.

† ; *S. dufouri*, Eocene, Loire-Inférieure, COTTEAU, (5) pp. 147 & 148, pl. vii, figs. 14-17 ; *S. morgani*, Eocene, Mt. Gambier, Australia, *id.* (6) pp. 629 & 630, pl. xix, figs. 10-14 ; *S. patella*, Eocene of Australia, TATE, p. 275 : n. spp.

*Scutellinide* : definition and affinities of the family ; COTTEAU, (3) pp. 303, *et seq.*

*Sismondia*, Desor : definition and affinities of genus, pp. 261 & 262 : list of 11 Eocene species not found in France, with diagnosis ; COTTEAU, (3) pp. 298-303.

† ; *S. altavillensis* (Defr.), Cott., Eocene of France, pp. 283-287, pl. 275, figs. 1-11 ; *S. archiaci*, Cott., *ib.*, pp. 262-265, pl. cclxviii ; *S. cailliaudi*, Cott., *ib.*, COTTEAU, (3) pp. 279-281, pl. cclxxxiii, figs. 7-10, and pl. cclxxiv, figs. 1-6 : and Eocene of Loire-Inférieure ; COTTEAU, (5) pp. 142 & 143, pl. vii, figs. 7-9. *S. desori*, Coquand, Eocene of France ; *id.* (3) pp. 295-297, pl. cclxxvii, figs. 1-5. *S. gracilis*, Cott., *ib.* ; *id.* (3) pp. 281-283, pl. cclxxiv, figs. 7-10 : and Eocene, Loire-Inférieure ; *id.* (5) p. 143. *S. marginalis* (Desmoulins), Desor, Eocene of France ; *id.* (3) pp. 267-272, pl. cclxix, figs. 8-12, and pl. cclxx. *S. occitana* (Defr.), Desor, *ib.* ; *id.* (3) pp. 272-278, pls. cclxxi & cclxxii, and pl. cclxxxiii, figs. 1-6 : and Eocene, Loire-Inférieure ; *id.* (5) pp. 143 & 144. *S. planulata* (d'Archiac), Desor, Eocene of France ; *id.* (3) pp. 288-291, pl. cclxxv, figs. 12-15.

† ; *S. billiotti*, Eocene of France, COTTEAU, (3) pp. 293-295, pl. cclxxvi, figs. 6-14 ; *S. testudo*, *ib.*, *id.* (3) pp. 265-267, pl. cclxix, figs. 1-5 ; *S. vasseuri*, *ib.*, *id.* (3) pp. 291 & 292, pl. cclxxvi, figs. 1-5, and Eocene, Loire-Inférieure, *id.* (5) pp. 144 & 145, pl. viii, figs. 1-4 : n. spp.

†; *Spatangus æquidilatatus*, Mazzetti, v. sub. *S. pustulosus*, Wright. *S. delphinus*, Defrance, Upper Coralline Limestone and Greensand, Malta; GREGORY, (4) pp. 623 & 624: synonym, *S. desmaresti*, Wright. *S. desmaresti*, v. Münst., Upper Oligocene of Doberg; LIENENKLAUS, p. 139; v. sub. *S. delphinus*, Defrance. *S. (Maretia) hoffmanni*, Goldf., Upper Oligocene of Doberg; *id.* p. 140. *S. hoffmanni*, Wright, v. sub. *Sarsella duncani*, n. sp. *S. ocellatus*, Defrance, Tortonian, Carry, near Marseilles; GOURRET, p. 130. *S. ocellatus*, Wright, v. sub. *Sarsella duncani*, n. sp. *S. ornatus*, Cuv., from Cretaceous, Russia; see PIATNITZKY, p. 108. *S. purpureus*, O. F. M., from Largo Bay, Fife; A. BELL, p. 293: Postpliocene of Balestrate; DE GREGORIO, (1) pp. 232-235: Pliocene, Yorkshire; GREGORY, (2) p. 42: Pliocene of Great Britain; *id.* (3) pp. 42 & 43: Post-glacial; *id.* p. 46. *S. pustulosus*, Wright, Globigerina Limestone and Greensand, Malta; *id.* (4) p. 624: synonym, *S. æquidilatatus*, Mazzetti. *S. regina*, Gray, a synonym of *S. purpureus*, O. F. M.; *id.* (3) p. 42.

*S. purpureus*, O. F. M., and *S. raschi*, Lovén, diagnosis and distribution; HOYLE, pp. 424-426. *S. purpureus*, 54 faths., and *S. raschi*, Lovén, 345 faths., S.W. coast of Ireland; SLADEN, (1) p. 702.

†*S. castelli*, n. sp., PERON & GAUTHIER, Miocene of Algeria; in COTTEAU, (4) pp. 76-78, pl. i, fig. 1.

*Sphærechinus granularis*, Lam., diagnosis and distribution; HOYLE, p. 410.

†*Stegaster chalmasi*, Seunes, Cretaceous, Pyrenees; SEUNES, pp. 23 & 24, pl. i, fig. 1a-e, figs. 1 & 2 in the text.

†*Stellaster coombi*, Forb., and †*S. planensis*, Gein., Cretaceous, N. Bohemia; JAHN, p. 481.

†*Stirechinus scillæ* (Desmoulins) Desor, Malta; GREGORY, (4) p. 627: synonym, †*Echinus costatus*, Ag.

†*Stomechinus cesaredensis*, de Lor., pp. 104 & 105, pl. xviii, fig. 7, *S. choffati*, de Lor., pp. 102 & 103, pl. xvii, fig. 5, *S. distinctus*, Cott., pp. 106 & 107, pl. xviii, fig. 2, *S. microcyphus*, Wright, pp. 103 & 104, pl. xviii, fig. 3, Jurassic of Portugal; DE LORIOI (3).

*Stomoporus*, Cott.: definition of genus: COTTEAU, (1) p. 22. †*S. hispanicus*, Cott., Eocene of Callosa, Alicante; *id.* (1) pp. 23 & 24, pl. iii, figs. 1-4.

*Strongylocentrotus depressus* and *tuberculatus*, Lam., from Japan; IVES, (1) p. 214. *S. dröbachiensis*, O. F. M., from West Greenland, 3 faths.; IVES, (3) p. 480. *S. dröbachiensis* and *S. lividus*, Lam., diagnosis and distribution; HOYLE, pp. 409 & 410.

†*S. dröbachiensis*, Pliocene of Great Britain, p. 36, Glacial, p. 45; GREGORY, (3).

†*S. scaber*, Pliocene, Yorkshire, GREGORY, (2) pp. 41 & 42, pl. i, fig. 7: and Pliocene of Great Britain; *id.* (3) p. 36, pl. ii, fig. 7, n. sp.

†*Studeria spratti*, Wright, var. *elongata*, n. var.; GREGORY, (4) pp. 603 & 604, Lower Coralline Limestone, Malta.

*Temnechinus*, remarks on; GREGORY, (3) p. 29.

† ; *T. globosus*, Forbes, Pliocene of Great Britain; *id.* (3) p. 32. *T. melocactus*, Forbes, and *turbinatus*, Forbes, synonyms of *T. woodi*, L. Ag.; *id.* (3) p. 30. *T. woodi*, L. Ag., Pliocene, Yorkshire; GREGORY, (2) p. 38: and Pliocene of Great Britain; *id.* (3) pp. 30-32.

*Temnopleurus reynaudi*, Ag., and *T. toreumaticus*, Leske, from Japan; IVES, (1) p. 214.

† *Tholaster*, n. g., for † *Gibbaster munieri*; SEUNES, p. 23.

*Toxobrissus*, Desor: remarks on the genus; BITTNER, p. 137: distinct from *Metulia* and *Brissopsis*.

*Toxopneustes pileolus*, Lam., from Japan; IVES, (1) p. 214. *T. variegatus*, Lam., from Bahamas; IVES, (2) p. 337.

*Trachyaster*, Pomel: remarks on the genus; BITTNER, p. 139, and definition of genus; COTTEAU, (1) p. 41.

† ; *T. almeræ*, Cott., Eocene of Orcheta, Alicante; *id.* (1) pp. 43 & 44, pl. v, figs. 7-17. *T. globulus*, Pomel, Pliocene of Algeria; *id.* (4) pp. 130 & 131. *T. heberti*, Cott., Eocene of Alfâz, Alicante; *id.* (1) pp. 42 & 43, pl. v, figs. 5 & 6.

† *Trachpatagus depressus*, n. sp., Peron & Gauthier, Miocene, Algeria; in COTTEAU, (4) pp. 87-90, pl. i, fig. 4.

† *T. oranensis*, Pomel, Miocene, Algeria; COTTEAU, (4) pp. 85-87.

† *Tremulopygus crucifer*, Morton, Cretaceous, New Jersey; Clark, p. 76.

† *Triplacidia*, n. g., BITTNER, p. 143, for † *Micropsis biarritzensis*, Cott., † *M. fraasi*, Loriol, † *M. stachei*, Bittn., † *M. veronensis*, Bittn., and † *M. lorioli*, Cott.

*Typhlechinus*, Neumayr, to be given up, since it has been shown that † *T. sphericus* possesses ocular plates, and must therefore be left in the genus *Palaëchinus*; NEUMAYR, (1) p. 84.

#### 4. ASTEROIDEA.

PERRIER (4) adopts the following classification of Stellerids:—

1. *Forcipulatae*. Pedicellariæ straight and crossed, one of the two forms at least present (pp. 72-100). (*Brisingidae*, *Pedicillasteridae*, *Asteriadae*.)
2. *Spinulosa*. Skeleton composed of small ossicles carrying little mobile spines, often grouped into "pedicillaires en pince." Lateral plates not differentiated, or small (pp. 100-125). (*Echinasteridae*, *Asterinidae*, *Solasteridae*.)
3. *Valvulata*. Skeleton powerful, often in mosaic, covered with calcareous granules, and often carrying valvular pedicellariæ. A double row of large marginal plates (pp. 125-129). (*Goniasteridae*.)
4. *Paxillosa*. Ossicles of the skeleton often prolonged into little projecting columns carrying a bunch of spines, which can be differentiated into pedicellariæ with one or two branches.



Usually a double row of large marginals (pp. 129-144).  
(*Archasteridæ*, *Astropectinidæ*.)

5. *Velata*. Ossicles of the skeleton prolonged into paxillæ carrying long rays, and united by a membrane covering completely, and hiding, the whole dorsal surface (pp. 144-146). (*Pteraster*.)

*Asteroidea* of Trenton Formation ; AMI, (1) p. 58. Stellerids, various remains of, from Cambrian of Sardinia ; BORNEMANN, p. 433. *Asteroidea* of New England Coast ; FEWKES, pp. 90 & 91 : of Cardiff ; JAMES, p. 190 : of Labrador Coast ; PACKARD, pp. 370 & 371.

*Aganaster*, n. g., MILLER & GURLEY, p. 57, for *Protaster gregarius*, Meek & Worthen, 1869. *†A. gregarius*, Meek & Worthen sp. ; *iid.* (3) p. 57, pl. ix, figs. 10 & 11. *†A. sp.* ; *iid.* (3) p. 58, pl. ix, figs. 12 & 13.

*Anasterias*, Perrier : definition of the genus ; PERRIER, (4) pp. 91 & 92. *A. minuta*, Perrier, Cape Horn, 143 metres ; *id.* (4) pp. 93-97. *A. perrieri*, Studer ; *id.* (4) pp. 97-99.

*A. studeri*, n. sp., PERRIER, (4) pp. 99 & 100, Cape Horn, 320 metres.

*Aspidaster*, de Lor., diagnosis and remarks on ; DE LORIOI, (3) pp. 127 & 128.

*†A. delgadoi*, n. sp., DE LORIOI, (3) pp. 128 & 129, pl. xxix, fig. 2, Lusitanian, Cintra, Portugal.

*Asteriade* : diagnosis ; PERRIER, (4) p. 77.

*Asterias* : definition of genus ; PERRIER, (4) p. 77 ; *cf.* Appendix, pp. 159 & 160. *A. amurensis*, Lütke, from Japan ; IVES, (1) p. 212, pl. viii, figs. 5-8. *A. grønlandica*, Steenstrup, and *A. polaris*, M. & Tr., from W. Greenland ; *id.* (3) p. 480. *A. rubens*, description and distribution ; BELL, (3) pp. 469-477, pl. xiv : on S.W. Coast of Ireland, 4 faths. ; SLADEN, (1) p. 698. *A. rubens*, var. *attenuata*, Hodge, description and distribution ; BELL, (3) pp. 477 & 478. *A. spirabilis*, Bell, Cape Horn ; PERRIER, (4) pp. 87-91. *A. torquata*, Sladen, from Japan ; IVES, (1) p. 212.

*A. mazophorus*, from 188-220 faths., WOOD-MASON & ALCOCK, (2) pp. 436 & 437 ; *A. murrayi*, BELL, (3) pp. 478 & 479, pl. xv : n. spp.

*Asterina fimbriata*, Perrier, Cape Horn ; PERRIER, (4) pp. 111 & 112, pl. xii, figs. 5a, b. *A. pectinifera*, M. & Tr., from Japan ; IVES, (1) p. 212, pl. x, figs. 1-4.

*Asterinidæ* : definition of family ; PERRIER, (4) p. 107.

*Asterodon*, Perrier : description of genus ; PERRIER, (4) pp. 129-132 : identical with *Gnathaster*, Sladen, which has the priority ; *id. t. c.* pp. 188 & 189. *A. grayi*, Bell sp., Cape Horn, 97 metres ; *id.* (4) pp. 138-140 [*cf.* pp. 188 & 189]. *A. singularis*, M. & Tr., Straits of Magellan ; *id.* (4) pp. 134 & 135, pl. xiii, figs. 3a, b [*cf.* also pp. 188 & 189].

*A. granulatus*, Punta-Arenas, PERRIER, (4) pp. 132-134 [*cf.* pp. 188 & 189], pl. xi, figs. 4a, b ; *A. pedicellaris*, Cape Horn, 10-35 metres, *id.* (4) pp. 135-188 [*cf.* pp. 188 & 189], pl. xiii, figs. 1a, b : n. spp.

*Astrogonium*, Perrier : diagnosis ; PERRIER, (4) p. 125.

*A. patagonicum*, n. sp., PERRIER, (4) pp. 125-127, pl. xiii, figs. 2a, b, Cape Horn (Beagle Channel), 283 metres.

*Astropecten armatus*, M. & Tr., from Japan; IVES, (1) p. 211. *A. articulatus*, Say, from Bahamas; *id.* (2) pp. 337-339, pl. xvi, figs. 4-8. *A. duplicatus*, Gray, from Bahamas; *id.* (2) p. 339. *A. irregularis*, Linck, from S.W. Coast of Ireland, 345, 24, & 50 faths.; SLADEN, (1) p. 688. *A. japonicus*, M. & Tr., from Japan; IVES, (1) p. 211, pl. vii, figs. 5-9. *A. scoparius*, M. & Tr., from Japan; *id.* (1) p. 211, pl. viii, figs. 1-4.

*Bathybiaster vexillifer*, Wyv.-Th., description of the type specimen; BELL, (8) pp. 228-231, pls. xxiii & xxiv.

*Biringa coronata*, Sars, S.W. Coast of Ireland, 345 faths.; SLADEN, (1) p. 698.

*B. andamanica*, 405 faths., pp. 439 & 440, *B. bengalensis*, 561 faths., p. 439, *B. insularum*, 1043 faths., p. 439, WOOD-MASON & ALCOCK, n. spp.

*Brisingiæ*: diagnosis; PERRIER, (4) p. 72.

*Calliderma*, Gray: diagnosis of the genus; SLADEN, (2) p. 4. †*C. latum*, Forbes, Cretaceous, England; *id.* (2) pp. 12-14, pl. ii, figs. 1a-e, 2a-d, pl. iii, figs. 1a-e, 2a, b, 3a, b. †*C. mosaicum*, Forbes, *ib.*; *id.* (2) pp. 9-11, pl. v, figs. 2a-e, pl. vi, figs. 1 & 2a-c, pl. vii, figs. 4a-c. †*C. smithiæ*, Forbes, *ib.*; *id.* (2) pp. 6-9, pl. i, figs. 1a-f, pl. viii, figs. 2a-c.

†*Calycaster*, n. g., PERRIER, (2) p. 1226, and *id.* (5) p. 262.

*C. monecus*, n. sp., East of Azores, PERRIER, (2) p. 1226, and *id.* (5) pp. 262-264, 1557 metres.

†*Cribraster sladeni*, n. g. & sp., PERRIER, (4) pp. 104 & 105, pl. x, figs. 2a, b, Cape Horn; *cf.* Appendix, pp. 161-163: compared with *Perknaster*, Sladen; *id.* (4) pp. 161-163.

*Cribrella obesa*, Sladen, comparison with new species; PERRIER, (4) p. 160. *C. oculata*, var. *abyssicola*, Norman, S.W. Coast of Ireland, 750 faths.; SLADEN, (1) p. 698. *C. sanguinolenta*, O. F. M., from Japan; IVES, (1) p. 212, pl. ix, figs. 1-4.

*C. hyadesi*, 35-200 metres, pp. 100-102, *studei*, 99 metres, pp. 102 & 103, Cape Horn, n. spp.

*Crossaster australis*, n. sp., PERRIER, (4) pp. 113-116, Cape Horn, 65-198 metres.

*Otenodiscus australis*, Lovén sp., Cape Horn, 51-283 metres; PERRIER, (4) pp. 143 & 144.

*Cycethra*, Bell: characters and divisions of the genus; PERRIER, (4) pp. 170-188. *C. electilis*, Sladen, Patagonia; *id.* (4) pp. 180 & 181. *C. nitida*, Sladen, Patagonia, description; *id.* (4) pp. 177-180. *C. simplex*, Studer, Cape Horn, 35 metres; *id.* (4) pp. 122-125, *cf.* pp. 170-188.

*C. asterias*, p. 176, *asteriscus*, p. 184, *calva*, p. 183, *elongata* (120 metres), p. 172, *media* (16 metres) p. 174, *regularis*, p. 184, *subelectilis*, p. 181, Cape Horn, PERRIER (4), n. spp.

√*Dictyaster*, n. g., for *D. xenophilus*, n. sp.; WOOD-MASON & ALCOCK, (2) pp. 438 & 439, 188-220 & 250 faths.

√*Diplasterias*, n. g., for *Asterias sulcifer*, Valenciennes, *A. steineni*, Studer and 3 new species; PERRIER, (4) p. 77; *cf.* Appendix, p. 160.

*D. lovénii*, Perrier, Cape Horn, 320 metres ; PERRIER, (4) pp. 80 & 81.  
*D. lütkeni*, Perrier, Cape Horn, 95–220 metres ; *id.* (4) pp. 81 & 82. *D. spinosa*, Perrier, Cape Horn ; *id.* (4) pp. 82–84. *D. steineni*, Studer, South of Cape Horn, 99 metres ; *id.* (4) pp. 84–86. *D. sulcifera*, Valenciennes sp., Cape Horn, 16–143 metres ; *id.* (4) pp. 77–80.

*Dytaster exilis*, Sladen, from 1748, 1803, & 1924 faths. ; WOOD-MASON & ALCOCK, (2) p. 429.

*D. anacanthus*, pp. 429 & 430, 1748 faths., WOOD-MASON & ALCOCK (2) ;  
*D. intermedius*, Chalut, 2870 metres, PERRIER, (2) p. 1226, and *id.* (5) p. 271 : n. spp.

*Echinaster spinosus*, Retz, from Bahamas ; IVES, (2) p. 339.

*Echinasteridae* : diagnosis of the family ; PERRIER, (4) p. 100.

*Freyella benthophila*, Sladen, from 1520 & 1590 faths. ; WOOD-MASON & ALCOCK, (2) p. 440.

*Fromia japonica*, Perrier, from New Caledonia ; DE LORIOI, (2) p. 31.

*Ganeria robusta*, Perrier, Cape Horn, 28 metres ; PERRIER, (4) pp. 119–121, pl. xi, figs. 1a, b.

*G. hahni*, 135 metres, pp. 118 & 119, pl. xi, figs. 3a, b, *papillosa*, pp. 121 & 122, pl. xii, figs. 1a, b, Cape Horn (Orange Bay), PERRIER, (4), n. spp.

*Goniasteridae* : diagnosis ; PERRIER, (4) p. 125.

*Goniopecten*, Perrier ; see PERRIER, (4) pp. 189–190.

*G. fleurbaei*, n. sp., PERRIER, (4) pp. 140–142, pl. xii, figs. 2a, b, Cape Horn, 198–283 metres.

*Hexaster*, n. g., for *H. obscurus*, n. sp. ; PERRIER, (2) p. 1227, and *id.* (5) p. 267, Terre-Neuve, 155 metres.

*Hippasteria hyadesi*, Perrier, S.E. of Port Famine, Cape Horn, 326 metres ; PERRIER, (4) pp. 128 & 129.

*Hymenaster giganteus*, n. sp., SLADEN, (1) pp. 696–698, pl. xxviii, figs. 1–3, S.W. Coast of Ireland, 750 faths.

*H. nobilis*, Wyv.-Th., from 1748 faths. ; WOOD-MASON & ALCOCK, (2) p. 437.

*Hyphalaster tara*, n. sp., WOOD-MASON & ALCOCK, (2) pp. 434 & 435, fig. 11, from 1997 & 1748 faths.

*Labidiaster*, Lütken : comparison and criticism of Sladen's Challenger species, *L. radiosus*, Lovén, and *L. annulatus*, Sladen ; PERRIER, (4) pp. 148–159. *L. radiosus*, Lovén, from Cape Horn, description ; PERRIER, (4) pp. 72–76, pl. viii, Appendix, pp. 148–159.

*Lebrunaster pacillosus*, n. g. & sp., PERRIER, (4) pp. 116 & 117, Cape Horn.

*Linckia guildingii*, Gray, from Bahamas ; IVES, (2) p. 339.

*Luidia bellona*, Lütken, from Mazatlan ; DE LORIOI, (2) pp. 22–24, pl. iii, fig. 13. *L. ciliaris* (Philippi), Gray, 52 faths., and *L. sarsii*, Düb. & Kor., from S.W. Coast of Ireland ; SLADEN, (1) p. 688. *L. clathrata*, Say, from Bahamas ; IVES, (2) p. 339. *L. quinaris*, Martens, from Japan ; *id.* (1) p. 211, pl. ix, figs. 5–9.

*L. penangensis*, n. sp., Penang ; DE LORIOI, (2) pp. 24–26, pl. iii, fig. 2.

*Lophaster pentactis*, Perrier, Cape Horn, 200 metres ; PERRIER, (4) pp. 112 & 113, pl. ix, figs. 3a, b.

*Marsipaster hirsutus*, Sladen, from 1997 faths. ; WOOD-MASON & ALCOCK, (2) p. 437.

*Mediaster*, sp., from Coast of Goa, 740 faths. ; WOOD-MASON & ALCOCK, (1) p. 13.

*M. stellatus*, n. sp., PERRIER, (2) p. 1226, and *id.* (5) pp. 268 & 269, locality ?

*Nardoa egyptiaca* (Gray), Sladen, from Maurice Island ; DE LORIOLE, (2) pp. 30 & 31.

*N. semiregularis*, var. *japonica*, Martens, from Japan ; IVES, (1) p. 212, pl. vii, figs. 1-4.

*N. finschii*, pp. 28-30, pl. ii, fig. 4, *N. mollis*, pp. 26-28, pl. iii, fig. 4, New Britain, DE LORIOLE (2), n. spp.

*Neomorphaster eustichus*, Sladen, from S.W. Coast of Ireland, 750 faths. ; SLADEN, (1) p. 694.

*Nymphaster*, Sladen : diagnosis of genus ; SLADEN, (2) p. 14. *N. protentus*, Sladen, from S.W. Coast of Ireland ; *id.* (1) p. 694. *N.* sp., probably *N. protentus*, Sladen, from 220-240 faths., off West Coast of Andamans ; WOOD-MASON & ALCOCK, (1) p. 13.

†*N. coombii*, Forbes, Cretaceous, England ; *id.* (2) pp. 15-18, pl. vii, figs. 1-3, pl. viii, figs. 1a, b.

†*N. marginatus*, pp. 18 & 19, pl. viii, figs. 4a, b, *oligoplax*, pp. 19-21, pl. viii, figs. 4a, b, Cretaceous, England, SLADEN (2), n. spp.

†*Onychaster asper*, p. 74, pl. xiii, figs. 3-5, *confragosus*, pp. 74 & 75, pl. xii, figs. 6 & 7, *demissus*, pp. 75 & 76, pl. xii, figs. 8-10, Keokuk Group, Missouri, MILLER (3), n. spp.

†*Paleaster*, sp. ?, from Rome, New York ; WALCOTT, (1) p. 347.

†*P. meridionalis*, n. sp., ETHERIDGE, pp. 199 & 200, pl. xxx, figs. 16 & 17, Upper Silurian, near Melbourne.

*Paragonaster*, sp. near *ctenipes*, Sladen, and *P.* sp. ? from 17-18 faths. ; WOOD-MASON & ALCOCK, (2) p. 436.

*Pedicillaster scaber*, E. A. Smith, Cape Horn, 140 metres ; PERRIER, (4) pp. 76 & 77. *P.* sp., from W. Coast of Andamans, 220-240 faths. ; WOOD-MASON & ALCOCK, (1) p. 14.

*P. parvulus*, n. sp., PERRIER (2) and *id.* (5) pp. 258 & 259, Terre-Neuve, 155 metres.

*Pentaceros reticulatus*, L., from Bahamas ; IVES, (2) p. 339.

*Pentagoniasteridae*, Perrier ; diagnosis of the family ; SLADEN, (2) p. 3.

*Pentagonaster*, Linck. : diagnosis of genus ; SLADEN, (2) p. 24.

†*P. lunatus*, Woodw., Cretaceous, England ; SLADEN, (2) pp. 25-27, pl. iv, figs. 1a-c.

*P. austrogranularis*, Cape Horn, 340 metres, PERRIER, (4) pp. 127 & 128, pl. xii, figs. 3a, b ; *P. balteatus*, pp. 688-690, pl. xxv, figs. 1-5, *concinuus*, pp. 690-693, pl. xxvi, figs. 1-5, S.W. Coast of Ireland, 750 faths., SLADEN (1) : n. spp.

†*P. megaloplax*, *id.* (2) pp. 27 & 28, pl. iv, figs. 2-4, = *Goniaster (Astro-*

*gonium*) *lunatus*, Forbes, (non *Asterias lunatus*, Woodward), Cretaceous, England: n. sp.

*Persephonaster*, n. g., p. 430, for *P. croceus*, pp. 430 & 431, *P. rhodopeplus*, n. spp., 738 faths., WOOD-MASON & ALCOCK, (2) pp. 431 & 432.

*Plectaster*, sp., from W. Coast of Andamans, 220-240 faths.; WOOD-MASON & ALCOCK, (1) p. 14.

*Plutonaster bifrons*, (WYV.-TH.), Sladen, from S.W. Coast of Ireland, 750 faths.; SLADEN, (1) p. 687. *P. sp.*, from Coast of Goa, 740 faths.; WOOD-MASON & ALCOCK, p. 13.

*P. granulatus*, n. sp., PERRIER (2), and *id.* (5) pp. 269-271, Chalut 1384 metres.

*Pontaster limbatus*, Sladen, from S.W. Coast of Ireland, 345 faths.; SLADEN, (1) p. 687. *P. sp.*, near to *P. venustus*, Sladen, taken near the Elicapeni Shoal, Laccadive Sea, 1000 faths.; WOOD-MASON & ALCOCK, (1) p. 12.

*P. hispidus*, n. sp., WOOD-MASON & ALCOCK, (2) pp. 428 & 429, 1043-1093 faths.

*Porania*, Gray, comparison and criticism of Sladen's 'Challenger' species; PERRIER, (4) pp. 163-169. *P. antarctica*, Studer, Cape Horn, 20-320 metres; *id.* (4) pp. 107-110.

*Poraniopsis*, n. g., pp. 105 & 106, for *P. echinaster*, n. sp., pp. 106 & 107, pl. x, figs. 2 & 2a, PERRIER (4).

*Porcellanaster caruleus*, WYV.-TH., from 683 faths., p. 433, and species near *caruleus*, from 1664 and 1748 faths., p. 434; WOOD-MASON & ALCOCK (2). *P. sp.*, probably *P. caruleus*, Sladen, Coast of Goa, 740 faths.; *id.* (1) p. 13.

*Procnaster*, n. g., for *P. grimaldii*, n. sp.; PERRIER, (2) p. 1226: dredged north of the Azores, 2870 metres; *id.* (5) p. 259.

*P. grimaldii*, n. sp., PERRIER, (5) pp. 259-262, 2870 metres, Station 248 of the 'Hirondelle.'

*Pseudarchaster mozaicus*, n. sp., WOOD-MASON & ALCOCK, (2) pp. 432 & 433, 188-200 faths.

*Psilaster andromela* (M. & Tr.), Sladen, S.W. Coast of Ireland; SLADEN, (1) p. 688.

*Pteraster ingoufi*, pp. 144 & 145, pl. xii, figs. 4a, b, 270 metres, *lebruni*, pp. 145 & 146, pl. xiii, figs. 4a, b, PERRIER, (4) 80 metres, Cape Horn; *P. personatus*, S.W. Coast of Ireland, 750 faths., SLADEN, (1) pp. 694-696, pl. xxvii, fig. 1-5: n. spp.

*Pycnaster*, n. g., SLADEN, (2) p. 21, for †*Goniaster angustatus*, Forbes, Cretaceous, England; *id.* (2) pp. 21-24, pl. ix, figs. 1a, b.

†*Schaenaster legrandensis*, n. sp., MILLER & GURLEY, pp. 56 & 57, pl. ix, figs. 7-9, Kinderhook Group, Iowa.

†*Sclerasterias*, n. g., for *S. guernei*, n. sp., Gulf of Gascogne, 240-300 metres; PERRIER, (2) p. 1227, and *id.* (5) p. 264.

*Solasteridae*: diagnosis of family; PERRIER, (4) p. 112.

*Stichaster roseus* (O. F. M.), Sars, from S.W. Coast of Ireland, 50-52 faths.; SLADEN, (1) p. 694.

*Stolasterias neglecta*, n. sp., PERRIER, (5) pp. 266 & 267, Gulf of Gascony, 166 metres.

*Styracaster horridus*, Sladen, from 1748 & 1803 faths.; WOOD-MASON & ALCOCK, (2) p. 434.

*S. clavipes*, n. sp., WOOD-MASON & ALCOCK, p. 434, 1748 faths.

*Zoraster fulgens*, Wyv.-Th., from S.W. Coast of Ireland, 750 faths.; SLADEN, (1) p. 694. *Z. sp.* from 1043 faths.; WOOD-MASON & ALCOCK, (2) p. 436. *Z. sp.*, probably *Z. ackleyi*, Perrier, from West Coast of Andamans, 220-240 faths.; *id.* (1) p. 14.

## 5. OPHIUROIDEA.

*Ophiuroidea* of the New England Coast; FEWKES, p. 91: of Cardiff; JAMES, p. 190; of the Labrador Coast; PACKARD, p. 370: various *Ophiuroids* from the Bay of Bengal; WOOD-MASON & ALCOCK, (1) pp. 14 & 15, and *id.* (2) p. 442.

*Amphiura sundevalli*, M. & Tr., from West Greenland, 3 faths.; IVES, (3) p. 479.

*A. stearnsii*, n. sp., IVES, (2) pp. 339 & 340, pl. xvi, figs. 1-3, from Bahamas.

*Asterias noctiluca*, Viviani: the name applied by the author to the young of several species; BELL, (6) pp. 341 & 342.

*Astrophyton costatum*, Lym., from Bahamas; IVES, (2) p. 340.

*Gorgonocephalus lincii*, M. & Tr., the true name of the "Shetland Argus"; BELL, (6) pp. 342-344.

*Ophiobyrsa hystrix*, Lyman (?), from S.W. Coast of Ireland, 345 faths.; SLADEN, (1) p. 699.

*Ophiocten sericeum*, Forbes, West Greenland, 3 faths.; IVES, (3) p. 480.

*Ophioglypha lacertosa* (Linck.), Lyman, 4-5 faths.; *O. albidu* (Forbes), Lyman, 6 faths.; *O. signata*, Verrill, 345 faths.: from S.W. Coast of Ireland: SLADEN, (1) p. 698. *O. robusta*, Lyman, from West Greenland, 3 faths.; IVES, (3) p. 480.

*Ophiopholis bellis* (Linck.), Lyman, S.W. Coast of Ireland, 50-54 faths.; SLADEN, (1) p. 699.

*Ophioplocus imbricatus*, M. & Tr., from Japan; IVES, (1) p. 213, pl. xi, figs. 6-10.

*Ophiothrix fragilis*, L., description; BELL, (6) pp. 338 & 339: off S.W. Coast of Ireland, 5 & 50 faths; SLADEN, (1) p. 699. *O. luetkeni*, Wyv.-Th., description; BELL, (6) p. 339. *O. oerstedii*, Lützk., from Bahamas; IVES, (2) p. 340.

*Ophiura*, Lam.: use of the name; BELL, (6) pp. 339 & 340. *O. ciliaris*, Linn., for *Ophioglypha ciliata*, &c.; *id.* (6) p. 341. *O. cinerea*, M. & Tr., and *O. mulleri*, Lützk., from Bahamas; IVES, (2) p. 339.

†*Ophiurites trunensis*, n. sp., BÖHM, p. 100, taf. iv, fig. 14a-h (non e, f), Cretaceous, Upper Bavaria.

*Pectinura stearnsii*, n. sp., IVES, (1) pp. 212 & 213, pl. xi, figs. 1-5, Japan.

## 6. CRINOIDEA.

MILLER (2), after discussing the characters of fossil Crinoids, on which their classification should be based, pp. 275-286, adopts the following division into families:—

## A. Genera having two basals:—

Family 1. *Dichocrinidæ*: *Cotyledonocrinus*, *Dichocrinus*, *Talarocrinus*.

Family 2. *Pterotocrinidæ*: *Pterotocrinus*.

Family 3. *Acrocrinidæ*: *Acrocrinus*.

## B. Genera having three basals, no subradials, no regular interradians:—

Family 4. *Symbathocrinidæ*: *Symbathocrinus*.

Family 5. *Calceocrinidæ*: *Calceocrinus*, *Deltacrinus*, *Halysiocrinus*.

## C. Genera having three basals, no subradials, regular interradians:—

Family 6. *Actinocrinidæ*: *Actinocrinus*, *Alloprosallocrinus*, *Agaricocrinus*, *Amphorocrinus*, *Batocrinus*, *Dorycrinus*, *Eretmocrinus*, *Gennæocrinus*, *Megistocrinus*, *Physetocrinus*, *Succocrinus*, *Steganocrinus*, *Strotocrinus*, *Teleiocrinus*.

Family 7. *Platycrinidæ*: *Coccocrinus*, *Cordylocrinus*, *Eucladocrinus*, *Macrostylocrinus*, *Marsupiocrinus*, *Platycrinus*.

Family 8. *Dolatocrinidæ*: *Allocrinus*, *Dolatocrinus*, *Hadrocrinus*, *Stereocrinus*.

Family 9. *Arthracanthidæ*: *Arthracantha*.

## D. Genera having three basals, subradials, no regular interradians:—

Family 10. *Ichthyocrinidæ*: *Ichthyocrinus*, *Lecanocrinus*, *Mespilocrinus*.

Family 11. *Ampheristocrinidæ*: *Ampheristocrinus*, *Closterocrinus*?

## E. Genera having three basals, subradials, and regular interradians:—

Family 12. *Taxocrinidæ*: *Forbesocrinus*, *Onychocrinus*, *Taxocrinus*.

## F. Genera having four basals, no subradials, regular interradians:—

Family 13. *Eucalyptocrinidæ*: *Eucalyptocrinus*, *Hypanthocrinus*.

Family 14. *Melocrinidæ*: *Compsocrinus*, *Mariacrinus*, *Melocrinus*, *Technocrinus*.

Family 15. *Xenocrinidæ*: *Xenocrinus*.

## G. Genera having five basals, five subradials, no regular interradians:—

Family 16. *Cyathocrinidæ*: *Abrotocrinus*, *Arachnocrinus*, *Bursacrinus*, *Carabocrinus*, *Cyathocrinus*, *Graphiocrinus*, *Palæocrinus*.

Family 17. *Poteriocrinidæ*: *Atelestocrinus*, *Barycrinus*, *Cæliocrinus*, *Euspirocrinus*, *Homocrinus*, *Hydreionocrinus*, *Poteriocrinus*, *Scaphiocrinus*, *Vasocrinus*, *Zeacrinus*.

Family 18. *Dendrocrinidae*: *Dendrocrinus*, *Ottawacrinus*.

Family 19. *Eupachycrinidae*: *Aesiocrinus*, *Delocrinus*, *Eupachycrinus*, *Ulocrinus*.

Family 20. *Erisocrinidae*: *Erisocrinus*, *Menocrinus*, *Stemmato-crinus*.

Family 21. *Agassizocrinidae*: *Agassizocrinus*.

Family 22. *Merocrinidae*: *Merocrinus*.

H. Genera having five basals, five subradials, regular interradians:—

Family 23. *Gaurocrinidae*: *Gaurocrinus*, *Reteocrinus*.

Family 24. *Rhodocrinidae*: *Archæocrinus*, *Goniasteroidocrinus*, *Lyriocrinus*, *Rhapanocrinus*, *Rhodocrinus*.

Family 25. *Glyptasteridae*: *Glyptaster*, *Lampterocrinus*, *Thysanocrinus*.

I. Genera having five basals, no subradials, regular interradians:—

Family 26. *Glyptocrinidae*: *Cupulocrinus*, *Glyptocrinus*, *Pycnocrinus*, *Schizocrinus*, *Siphonocrinus*.

Family 27. *Cleioocrinidae*: *Cleioocrinus*.

K. Genera having five basals, no subradials, no regular interradians:—

Family 28. *Heterocrinidae*: *Ectenocrinus*, *Heterocrinus*, *Iocrinus*, *Ohioocrinus*.

Family 29. *Anomalocrinidae*: *Anomalocrinus*.

Family 30. *Belemnocrinidae*: *Belemnocrinus*.

Family 31. *Catillocrinidae*: *Catilloocrinus*.

Family 32. *Hybocrinidae*: *Hybocrinus*.

Family 33. *Haplocrinidae*: *Allageocrinus*, *Haplocrinus*.

Family 34. *Pisocrinidae*: *Pisocrinus*.

Family 35. *Edriocrinidae*: *Edriocrinus*.

Of uncertain family: *Myrtilloocrinus*, *Nipterocrinus*, *Camarocrinus*, *Ancyroocrinus*, *Aspidocrinus*, *Brachioocrinus*, *Coronocrinus*, *Cystocrinus*, *Pachycrinus*.

*Crinoidea* of the Trenton Formation; AMI, (1) p. 57: in the Keokuk Beds at Keokuk, Iowa; GORDON (2).

*Abrotocrinus*, n. g., pp. 30 & 31, for *A. cymosus*, n. sp., Keokuk Group, Indiana; MILLER & GURLEY, pp. 31 & 32, pl. v, fig. 2.

† *Actinocrinus*, sp. ? from Burlington Limestone; ROWLEY (2).

†; *A. grandis*, Keokuk Group, Indiana, MILLER & GURLEY, pp. 25 & 26, pl. v, fig. 1, & pl. vi, fig. 1; *A. nodosus*, Lower Carboniferous, Missouri, MILLER, (1) pp. 33 & 34, pl. v, fig. 7; *A. puteatus*, Lower Burlington Limestone, Louisiana, ROWLEY (3) & HARE, pp. 101 & 102, pl. ii, fig. 16: n. spp.

*Actinometra trichoptera*, Müll., sp., Port Phillip; CARPENTER, (4) p. 135.

*A. gracilis*, Palo Edam, *A. monobrachius*, China Sea, HARTLAUB, pp. 187 & 188: n. spp.



† *Aesiocrinus*, n. g., pp. 14 & 15, for † *A. magnificus*, pp. 15 & 16, pl. ii, figs. 1-5, † *A. harii*, p. 16, pl. iii, fig. 1, † *A. basilicus*, pp. 53 & 54, pl. ix, figs. 4, 5, & 6, n. spp., Upper Coal Measures, Kansas City; MILLER & GURLEY.

† *A. lykinsi*, n. sp., BUTTS, p. 1, with a figure, Coal Measures of Kansas City.

†; *Agaricocrinus americanus*, Roemer, from Keokuk, Iowa; GORDON, (1) figs. 2-5. *A.*, sp. ? from Burlington Limestone; ROWLEY (2). *A. wortheni*, Hall, from Keokuk, Iowa; GORDON, (1) figs. 1 & 6.

†; *A. decorus*, Burlington Limestone, Louisiana, Mo., ROWLEY (5) & HARE, p. 117, pl. iii, fig. 10; *A. dissimilis*, pp. 55-58, pl. viii, fig. 11, *gorbyi*, pp. 54 & 55, pl. viii, fig. 9, *indianensis*, pp. 53 & 54, pl. viii, fig. 5, Keokuk Group, Indiana, MILLER (3); *A. splendens*, Keokuk Group, Indiana, MILLER & GURLEY, pp. 18 & 19, pl. iv, figs. 1 & 2, and MILLER, (3) p. 55, pl. viii, fig. 10 : n. spp.

† *Alloocrinus benedicti*, n. sp., MILLER, (3) p. 37, pl. vii, fig. 1, Lower Silurian, Indiana.

† *Alloprosalloocrinus gurleyi*, n. sp., MILLER, (3) pp. 58 & 59, pl. x, figs. 1 & 2, Subcarboniferous, Kentucky.

† *Antedon choffati*, de Lor., Lusitanian, Portugal; DE LORIOI, (3) pp. 161 & 162, pl. xxix, figs. 7-11. *A. dübeni*, Böhlische, from Madeira: the following forms probably all represent but one specific type, viz.,—*A. adeone*, Delle Chiaje, *A. annulata*, Risso, *A. barbata*, Linck, *A. bicolor*, D. Ch., *A. bifida*, Penn., *A. coralina*, Risso, *A. decacnemor*, Penn., *A. decameros*, Gray, *A. dübeni*, Böhlische, *A. europæa*, Leach, *A. fimbriata*, Barrolier, *A. fimbriata*, Duj. (non Lam.), *A. fimbriata*, Miller, *A. gorgonia*?, Fréminville, *A. mediterranea*, Lam., *A. milleri*, Müller, *A. pectinata*, L. (non Retz), *A. petosus*, Düb. & Kor., *A. rosacea*, Linck; CARPENTER, (3) pp. 68 & 69. *A. lusitanica*, Carp., 500-700 faths., and *phalangium*, Müll., 100 faths. and 500-700 faths., from Madeira; *id.* (3) pp. 65-67. *A. macronema*, Müll., sp., *pumila*, Bell, *wilsoni*, Bell, Port Phillip; *id.* (4) p. 135. *A. quadrata*, Carp., distinct from *A. eschrichti*; *A. proluxa*, Dunc. & Sl., distinct from *A. tenella*, Retz. (= *A. sarsii*, Düb. & Kor.); *id.* (2). *A. rosacea*, Linck, from S.W. Coast of Ireland, 4 faths.; SLADEN, (1) p. 687.

*A. affinis*, Amboina, pp. 184 & 185, *afra*, Bowen, p. 172, *amboinensis*, Amboina, p. 181, *bella*, Noordwacter Eiland, 15-20 faths., pp. 174 & 175, *bengalensis*, Gulf of Bengal, p. 182, *brockii*, pp. 183 & 184, *clara*, Amboina, p. 174, *conifera*, Japan, pp. 173 & 174, *crassispina*, Amboina, Cochin China, HARTLAUB, pp. 185 & 186; † *A. delgadoi*, p. 163, pl. xxix, fig. 15, † *A. gaivensis*, Lusitanian, Portugal, DE LORIOI, (3) pp. 162 & 163, pl. xxix, figs. 12-14; *A. erinacea*, Cebu Is., pp. 177 & 178, *finschii*, New Britain, pp. 176 & 177, *huyferi*, Wapoo (W. Africa), pp. 171 & 172, 21 faths., *japonica*, Japan, pp. 172 & 173, *klunzigeri*, Koseir, pp. 175 & 176, *kraepelini*, Akyab, p. 183, *lepida*, Tonga Is., p. 176, *martensi*, Singapore, pp. 182 & 183, *monacantha*, Mortlock Is., Torres Straits, p. 179, *nana*, Amboina, Tonga Is., pp. 170 & 171,

*nematodon*, Bowen, p. 185, *oxyacantha*, Amboina, pp. 178 & 179, *protecta*, Indian Archipelago and Polynesia, p. 180, *spinipinna*, Amboina, pp. 179 & 180, *tenera*, Queensland, Torres Straits, pp. 180 & 181, *tenuipinna*, New Britain, p. 178, HARTLAUB; *A.*, n. sp., CARPENTER, (4) p. 135, Port Phillip : n. spp.

*Antedon*, sp., 188–220 faths.; WOOD-MASON & ALCOCK, (2) p. 443.

†*Apiocrinus multipunctatus*, Quenst., v. sub. †*Millericrinus escheri*, de Lor.

†*Arachnocrinus canadensis*, n. sp., WHITEAVES, pp. 208 & 209, pl. xxviii, figs. 2 & 2a, Devonian, Mackenzie River Basin. [This is a *Pycnosaccus*, *fide* F. A. BATHER.]

†*Archæocrinus desideratus*, n. sp., BILLINGS, (2) pp. 249 & 250, with two figures on the plate, from Trenton Formation.

†*Austriocrinus* sp., BÖHM, p. 101, taf. iv, fig. 18a, 16a, & 17 a, b, Cretaceous, Upper Bavaria.

*Barycrinus* (1868), perhaps not distinguishable from *Botryocrinus* (1878); BATHER (2).

†; *B. blairi*, p. 25, pl. iii, figs. 11–13, *boonvillensis*, p. 24, pl. iii, fig. 5, Lower Carboniferous, Missouri, MILLER (1); *B. princeps*, Keokuk Group, Indiana, MILLER & GURLEY, pp. 52 & 53, pl. ix, figs. 2 & 3 : n. spp.

†; *Balanoocrinus campichei*, Choffat, v. sub. *B. pentagonalis*, Goldf. †*B. pentagonalis*, Goldf., Callovian, Portugal; DE LORIOI, (3) pp. 158 & 159, pl. xxix, figs. 1 & 2 : synonym, *B. campichei*, Choffat. *B. subteres* (Münst.), Ag., Lusitanian, Portugal; *id.* (3) pp. 159 & 160, pl. xxix, figs. 3 & 4 : synonym, *Pentacrinus cylindricus*, d'Orb. *B. subteroides*, Quenst., Middle Lias and Jurassic, Portugal; *id.* (3) pp. 156 & 157, pl. xxviii, fig. 5 : synonyms, *Pentacrinus cylindricus*, Desor, *P. liasinus*, d'Orb. *B. (aff.) subteroides*, Quenst., Middle Lias, Portugal; *id.* (3) p. 157, pl. xxviii, figs. 16–20.

†; *B. pustulosus*, Callovian, Portugal, p. 158, pl. xxviii, figs. 21 & 22, *penichensis*, pp. 155 & 156, pl. xxviii, fig. 14, *quiaiosensis*, p. 155, pl. xxviii, figs. 11–13, Jurassic, Portugal, DE LORIOI (3), n. spp.

†*Batocrinus longirostris*, from Burlington Limestone; ROWLEY (2).

†; *B. abscissus*, Keokuk Limestone, ROWLEY (5) & HARE, p. 115, pl. iii, fig. 6; *B. agnatus*, p. 53, pl. viii, figs. 1 & 2, *boonvillensis*, pp. 65 & 66, pl. x, fig. 13, Keokuk Group, Missouri, MILLER (3); *B. bulbosus*, Lower Burlington Limestone, Louisiana, ROWLEY (5) & HARE, pp. 114 & 115, pl. iii, fig. 5; *B. calvini*, Lower Burlington Limestone, Louisiana, ROWLEY (1) pp. 146 & 147, also *id.* (2), 1 woodcut; *B. cantonensis*, Keokuk Group, Indiana, MILLER & GURLEY, p. 36, pl. vi, fig. 9; *B. crawfordsvillensis*, Keokuk Group, MILLER (3) pp. 64 & 65, pl. x, figs. 11 & 12; *B. davisi*, Kaskaskia Group, Flag Pond, Va., ROWLEY (5) & HARE, pp. 116 & 117, pl. iii, fig. 9; *B. decorus*, Subcarboniferous, Indiana, MILLER, (3) pp. 61 & 62, pl. x, figs. 7 & 8; *B. facetus*, Keokuk Group, MILLER & GURLEY, p. 35, pl. vi, fig. 8; *B. gorbyi*, Keokuk Group, MILLER, (3) pp. 63 & 64, pl. x, fig. 10; *B. gurleyi*, Keokuk Limestone, Pike County, Mo., ROWLEY (5) & HARE, p. 115, pl. iii, fig. 7; *B. gurleyi*, Keokuk Group,

Missouri, MILLER, (3) pp. 66 & 67, pl. xi, figs. 9 & 10 ; *B. inflatus*, Lower Burlington Limestone, ROWLEY (4) & HARE, pp. 102 & 103, pl. ii, fig. 19 ; *B. jucundus*, Keokuk Group, Indiana, pp. 20 & 21, pl. iv, figs. 5 & 6, *marinus*, Keokuk Group, Indiana, pp. 19 & 20, pl. iv, figs. 3 & 4, MILLER & GURLEY ; *B. mediocris*, Keokuk Group, MILLER, (3) pp. 62 & 63, pl. x, fig. 9 ; *B. poculum*, Kinderhook Group, Iowa, MILLER & GURLEY, p. 34, pl. vi, figs. 6 & 7 ; *B. pulchellus*, Keokuk Group, Missouri, MILLER, (3) p. 68, pl. xi, figs. 13 & 14 ; *B. rotadentatus*, Lower Burlington Limestone, Louisiana, ROWLEY (4) & HARE, p. 102, pl. ii, figs. 17 & 18 ; *B. spergensis*, Subcarboniferous, Indiana, MILLER, (3) pp. 60 & 61, pl. x, figs. 5 & 6 ; *B. sweeti*, Keokuk Limestone, Mo., ROWLEY (5) & HARE, p. 116, pl. iii, fig. 8 ; *B. venustus*, Keokuk Group, Missouri, MILLER, (3) p. 67, pl. xi, figs. 11 & 12 : n. spp.

†*Belemnocrinus sampsoni*, n. sp., MILLER, (1) p. 26, pl. iii, fig. 8, Lower Carboniferous, Missouri.

†*Blairocrinus*, n. g., MILLER, (3) p. 69, for †*B. trijugis*, n. sp., *id.* (3), pp. 69 & 70, pl. xi, figs. 1-3, Subcarboniferous, Missouri.

*Botryocrinus*, Ang., diagnosis and description of the genus ; BATHER, (2) pp. 392 & 406-411.

† ; *B. decadactylus*, pp. 395-402, pl. xiii, figs. 5-15, *pinnulatus*, pp. 402-406, pl. xiii, fig. 6, *ramosus*, pp. 394 & 395, pl. xiii, figs. 1-4, *id. t. c.* : n. spp.

*Calceocrinus*, Hall : remarks on the genus ; BILLINGS, (4) p. 51. *C. contractus*, Ringueberg, from Lower Niagara Limestone, N. Y. ; RINGUEBERG.

† ; *C. indianensis*, MILLER, (3) pp. 35 & 36, pl. vi, fig. 37, Lower Silurian, Indiana ; *C. furcillatus*, pp. 51 & 52, with fig., *C. rugosus*, p. 52, with figs., Trenton Formation, Ontario, BILLINGS (4) : n. spp.

† *Calliercrinus acanthinus*, n. sp., RINGUEBERG, p. 302, pl. iii, fig. 1, Lower Limestone of the Niagara Group, Lockport, N. Y.

*Carabocrinus*, Bill., remarks on ; BILLINGS, (1) pp. 34 & 35.

† *Ctenocrinus* sp., OEHLERT, (2) pp. 835 & 836, fig. 1, pl. xviii, figs. 1, 1a, & 1b, Devonian.

† *Cyathocrinus*, sp. from. Lower Silurian, Indiana ; MILLER, (3) p. 49, pl. ix, fig. 8.

† ; *C. benedicti*, MILLER, (3) pp. 48 & 49, pl. ix, fig. 7, Lower Silurian, Indiana ; *C. boonvillensis*, p. 29, pl. iv, figs. 3 & 4, *C. sampsoni*, pp. 30 & 31, pl. iv, figs. 9 & 10, Lower Carboniferous, Missouri, *id.* (1) ; *C. gurleyi*, pp. 47 & 48, pl. ix, fig. 4, *C. labyrinthicus*, pp. 49 & 50, pl. xii, figs. 11-14, Keokuk Group, Missouri, *id.* (3) ; *C. opimus*, pp. 28 & 29, pl. v, fig. 5, Keokuk Group, Indiana, MILLER & GURLEY.

† *Cyrtocrinus*, n. g., pp. 602-605, for †*Eugeniocrinus nutans*, Goldf. ; and †*C. granulatus*, p. 611, taf. xxxvi, figs. 1-4, Neocomian of Sens, France, †*C. thersites*, pp. 610 & 611, taf. xxxv, Neocomian of Stramberg, n. spp. ; JAEKEL (2). †*C. nutans*, Goldf. sp., German Jura ; *id.* (2) pp. 605-610, taf. xxxiv.

† *Delocrinus*, n. g., pp. 9-12, †*Poteriocrinus hemisphaericus*, Shumard ; †*Eupachyocrinus craigi*, Meek & Worthen, †*E. fayettensis*, Worthen,

†*Cyathocrinus inflexus*, Geinitz., and 1 n. sp., viz., †*D. missouriensis*, p. 14, pl. ii, figs. 11–13, Upper Coal Measures, Kansas City, Missouri; MILLER & GURLEY. †*D. hemisphaericus*, Shumard, Upper Coal Measures, Kansas City; *id.* pp. 12 & 13, pl. ii, figs. 8–10, pl. x, fig. 5.

†*Dendrocrinus jewetti*, Billings, from Trenton Limestone; BILLINGS, (4) p. 51, with fig. †*D. proboscidiatus*, Billings, from Trenton Formation, Ottawa; *id.* (3) pp. 52 & 53, with fig.

†*D. ? nodibrachiatus*, n. sp., RINGUEBERG, pp. 303 & 304, pl. iii, fig. 6, Lower Niagara Limestone, Lockport, N. Y.

†*Diamenocrinus*, n. g., for †*D. jouani*, n. sp., Devonian; EHLERT, (2) pp. 83, *et seq.*, pl. xviii, figs. 2, 2a, 3, & 4.

†; *Dichocrinus blaini*, p. 36, pl. viii, fig. 12, Keokuk Group, Missouri, MILLER (3); *D. cinctus*, pp. 21 & 22, pl. iv, figs. 10–12, Kinderhook Group (Carboniferous), Le Grand, Iowa, MILLER & GURLEY; *D. humbergi*, pp. 26 & 27, pl. iii, figs. 9 & 10, Lower Carboniferous, Missouri, MILLER (1): Subcarboniferous (Keokuk Group), Missouri, *id.* (3) p. 36, pl. vi, fig. 38; *D. parvulus*, pp. 27 & 28, pl. iv, figs. 7 & 8, Lower Carboniferous, Missouri, *id.* (1); *D. ulrichi*, pp. 48 & 49, pl. viii, figs. 12 & 13, Keokuk Group, Indiana, MILLER & GURLEY: n. spp.

†*Dimerocrinus immaturus*, Hall, from Lower Niagara Limestone, Lockport, N. Y.; RINGUEBERG.

†*Dolichocrinus*, n. g., pp. 130 & 131, for †*Eugeniocrinus aberrans*, de Lor., from Callovian, Portugal, pp. 131 & 132, pl. xxiv, figs. 3 & 4; DE LORIOI (3) [v. sub. *Tetanocrinus*].

†*Dorycrinus unicornis* and *D.* sp.?, from Burlington Limestone; ROWLEY (2).

†; *D. amenus*, pp. 35 & 36, pl. v, figs. 5 & 6, *D. confragosus*, pp. 34 & 35, pl. v, figs. 12 & 13, Lower Carboniferous, Missouri, MILLER (1); *D. inflatus*, ROWLEY (5) & HARE, p. 114, pl. iii, fig. 4, Lower Burlington Limestone, Louisiana: n. spp.

†*Encrinus aculeatus*, v. Meyr, description; WAGNER, pp. 890–896, taf. xlix, fig. 4. †*E. wagneri*, Ben., description of a tegmen; *id.* pp. 879–887, taf. xlix, fig. 2, and woodcuts 1–3, and of a crown with regenerated arms, pp. 887–890, taf. xlix, fig. 4.

†*Eretmocrinus lyonanus*, n. sp., MILLER, (3) pp. 59 & 60, pl. x, figs. 3 & 4, Keokuk Group, Kentucky.

†*Eucalyptocrinus inconspicuous*, Ringueberg, from Lower Niagara Limestone, Lockport, N. Y.; RINGUEBERG.

†; *E. ellipticus*, pp. 38 & 39, pl. vii, fig. 4, *elrodi*, pp. 40 & 41, pl. vi, figs. 9 & 10, *gorleyi*, p. 39, pl. vii, figs. 5 & 6, *subglobosus*, pp. 37 & 38, pl. vii, fig. 3, Lower Silurian, MILLER (3); *E. muralis*, RINGUEBERG, pp. 305 & 306, pl. iii, fig. 3, Lower Niagara Limestone, Lockport, N. Y.: n. spp.

*Eudiocrinus*, sp., 922 faths., WOOD-MASON & ALCOCK, (2) p. 443.

*Eugeniocrinidae*, vide sub *Holopocrinidae*.

*Eugeniocrinus*, Miller, characters of genus; JAEKEL, (2) pp. 640–643, figs. 20–23. †*E. annularis*, Roemer, and †*E. essensis*, Roemer, were described from stem-joints, the proper determination of which was

impossible ; JAEKEL, (2) p. 563. †*E. caryophyllatus*, Goldf., Callovian, Portugal ; DE LORIOI, (3) pp. 132 & 133, pl. xxiv, fig. 6. †*E. carophyllatus*, v. Schoth sp. ; JAEKEL, (2) pp. 643-646, figs. 24 & 25. †*E. choffati*, de Lor., Callovian, Portugal ; DE LORIOI, (3) pp. 133 & 134, pl. xxiv, fig. 7. †*E. dumortii*, de Lor., †*E. armatus*, Zittel, †*E. alpinus*, Oost. sp., †*E. alpinus*, var. *clapsensis*, de Lor., †*E. alpinus*, var. *bemensis*, Oost. ; see JAEKEL, (2) pp. 647-651. †*E. hagenowi*, Goldf., is a *Bourgueticrinus*. †*E. hausmanni*, Roemer, is probably a *Millericrinid*, certainly not a *Eugenicrinid*, and †*E. ? hexagonus*, Munster, is a *Blastoid* ; *id.* (2) p. 563. †*E. hoferi*, Munst., Callovian, Portugal ; DE LORIOI, (3) pp. 134 & 135, pl. xxiv, fig. 8.

†*E. zitteli*, n. sp., JAEKEL, (2) pp. 646 & 647, taf. xli, Neocomian of Stramberg and Nesselssdorf.

*Eupachycrinidae*, n. fam., MILLER & GURLEY, p. 3, for *Eupachycrinus*, *Delocrinus*, and *Ulocrinus*.

†*Eupachycrinus harii*, MILLER, (3) pp. 71 & 72, pl. xi, fig. 8, Coal Measures, Missouri ; *E. magister*, pp. 4, 5, & 56, pl. i, figs. 1 & 2, & pl. x, figs. 6-8, *sphaeralis*, pp. 5 & 6, pl. i, figs. 3 & 4, Upper Coal Measures, Kansas City, Missouri, MILLER & GURLEY ; *E. tumulosus*, MILLER, (3) pp. 70 & 71, pl. ix, figs. 9 & 10, Kaskaskia Group, Kentucky : n. spp.

†*Euspirocrinus obconicus*, n. sp., BILLINGS, (2) pp. 248 & 249, with 3 figures on the plate, from Trenton Formation.

† ; *Extracrinus lepidotus*, Miller, v. sub. †*E. subangularis* (Miller), Morris. *E. subangularis* (Miller), Morris, Middle Lias, Portugal ; DE LORIOI, (3) pp. 160 & 161, pl. xxix, figs. 5 & 6 : synonym, †*E. lepidotus*, Miller. *E. subangularis*, Miller, from Middle Lias, Alderton Hill, Gloucestershire ; SMITH, p. 207.]

† ; *Forbesocrinus elegantulus*, MILLER, (1) p. 40, pl. v, figs. 14 & 15, Lower Carboniferous, Missouri ; *F. speciosus*, MILLER & GURLEY, pp. 27 & 28, pl. v, figs. 8 & 9, Keokuk Group, Indiana : n. spp.

†*Glyptaster (Encrinus) lockportensis*, n. sp., RINGUEBERG, pp. 304 & 305, pl. iii, fig. 4, Lower Niagara Limestone, Lockport, N. Y.

†*Glyptocrinus decadactylus*, from Sandy Creek, Jefferson County, N. Y. ; WALCOTT, (1) p. 349 : and from near Quebec ; AMI, (2) p. 496.

†*Goniasteroidocrinus tuberosus*, Lyon & Cassedy ; MILLER, (3) pp. 51 & 52, pl. ix, fig. 11.

†*Goniocrinus*, n. g., for †*G. sculptilis*, n. sp. ; MILLER & GURLEY, p. 32.

†*G. subtilis*, n. sp., *id.* p. 33, pl. vi, figs. 2-5, Kinderhook Group (Carboniferous), Le Grand, Iowa.

*Gymnocrinus*, de Lor., emended Jaekel, definition and characters of genus, pp. 631-638, figs. 16-19, †*G. moussoni*, Desor sp., pp. 639 & 640 ; JAEKEL (2).

†*Herpetocrinus fletcheri*, Salter, Wenlock Limestone, Dudley ; BATHER (5).

† ; *Heterocrinus canadensis*, from Pointe-aux-Frembles, near Quebec ; AMI, (2) p. 484. *H. heterodactylus*, from Rome, New York ; WALCOTT, (1) p. 347.

†*H. bellevillensis*, n. sp., BILLINGS, (3) pp. 49 & 50, 3 figs., Trenton Limestone, Ontario.

*Holopocrinidae*: definition, extent, and distribution of the family; JAEKEL, (2) pp. 565-572: relation of the genera to one another; *id.* pp. 659-661.

*Holopus*, d'Orb.: definition and distribution of genus; JAEKEL, (2) pp. 612-619, figs. 13 & 14 in the text. †*H. spileccensis*, for *Cyathidium spileccense*, Schül.; *id. l. c.* fig. 14, Lower Tertiary of N. Italy.

†*Hydreionocrinus pentagonus*, n. sp., MILLER & GURLEY, p. 17, pl. ii, figs. 6 & 7, Upper Coal Measures, Kansas City.

†*Ichthyocrinus conoideus*, n. sp., RINGUEBERG, p. 305, pl. iii, fig. 5, Lower Niagara Limestone, Lockport, N. Y.

†*Lecanocrinus macropetalus*, Hall, from Lower Niagara Limestone, Lockport, N. Y.; RINGUEBERG.

†*L. tennesseensis*, n. sp., MILLER, (3) p. 41, pl. vii, fig. 7, Lower Silurian, Tennessee.

†*Mariacrinus aureatus*, p. 34, pl. vi, fig. 36, *granulosus*, p. 35, pl. vi, fig. 35, Lower Silurian, Indiana, MILLER (3), n. spp.

†*Mesocrinus fischeri*, Gein., Cretaceous, N. Bohemia; JAHN, p. 481.

†*Millericrinus echinatus*, v. sub. †*M. escheri*, de Lor. †*M. escheri*, de Lor., Upper Callóvian and Lusitanian, Portugal; DE LORIOI, (3) pp. 139 & 140, pl. xxvi, figs. 1-4: synonyms, †*M. milleri*, Goldf., †*M. subechinatus*, d'Orb., †*M. echinatus*, d'Orb., †*M. tuberculatus*, d'Orb., †*Apiocrinus multipunctatus*, Quenst. †*M. granulosus*, Etallon, pp. 135 & 136, pl. xxiv, fig. 9, Upper Callovian, Portugal, *horridus*, d'Orb., pp. 138 & 139, pl. xxv, figs. 7-9, Callovian and Lusitanian, Portugal: synonyms, †*M. echinatus*, de Lor., and †*M. calcar*, de Lor.; †*M. mespiliformis*, d'Orb., pp. 141-143, pl. xxv, figs. 13-17, Lusitanian, Portugal: synonym, ?? *Pomatocrinus juegeri*, Koenig; †*M. milleri* (Schlotheim), d'Orb., pp. 140 & 141, pl. xxv, figs. 10-12, Lusitanian, Portugal: DE LORIOI (3). †*M. milleri*, Goldf., v. sub. †*M. escheri*, de Lor. †*M. rotiformis*, d'Orb., Upper Callovian, Portugal; *id.* (3), p. 137, pl. xxv, figs. 2 & 3. †*M. subechinatus*, d'Orb., v. sub. †*M. escheri*, de Lor. †*M. tuberculatus*, d'Orb., v. sub. †*M. escheri*, de Lor.

†; *M. algarbiensis*, p. 138, pl. xxv, figs. 4-6, Lusitanian, Algarve, Portugal, *cesaredensis*, p. 156, pl. xxv, fig. 1, Upper Callovian, Portugal, *lusitanicus*, Lusitanian, Portugal, pp. 144 & 145, pl. xxvi, figs. 5-11, DE LORIOI (3); *M. polyclonos*, FELIX, pp. 172-174, taf. xxvii, figs. 21-28, 33-39, & 43-46, from Upper Jura of Oaxaca, Mexico: n. spp.

†*Missouricrinus*, n. g., for †*M. admonitus*, n. sp., MILLER, (1) pp. 31 & 32, pl. iv, figs. 11 & 12, Lower Carboniferous, Missouri.

†*Myelodactylus gorbyi*, n. sp., MILLER, (3) pp. 72 & 73, pl. xi, figs. 7 & 8, Lower Silurian, Tennessee.

†; *Onychocrinus cantonensis*, p. 41, pl. vii, fig. 9; *O. ulrichi*, Keokuk Group, Indiana, MILLER & GURLEY, pp. 17 & 18, pl. iii, figs. 2 & 3: n. spp.

✓ *Ottawacrinus*, n. g., BILLINGS (4), for †*O. typus*, n. sp., pp. 49 & 50, with figs. on the pl., Trenton Limestone.

✓† *Pachyantedon beyrichi*, n. g. & sp., JAEKEL, (2) pp. 627 & 628, taf. xliii, fig. 5.

† ; *Pentacrinus cf. amblyscalaris*, Thurmman, Lusitanian, Portugal ; DE LORIO, (3) pp. 153 & 154, pl. xxviii, figs. 7-10. *P. basaltiformis*, Miller, Grey Limestone of the South Alps ; GLOECKELSTHURN, p. 3 : and Jurassic, Portugal ; DE LORIO, (3) pp. 145 & 146, pl. xxvi, figs. 12-19. *P. bronni*, v. Hagenow, Cretaceous, Upper Bavaria ; BÖHM, p. 161. *P. cylindricus*, d'Orb., v. sub. *Balanocrinus subteres* (Munst.). Ag., and *subteroides*, Quenst. *P. jaccardi*, de Lor., Toarcian, Portugal, p. 151, pl. xxvii, fig. 15, *P. jurensis*, Quenst., Upper Lias, Portugal, pp. 147 & 148, pl. xxvii, figs. 1-6 : synonym, *P. vulgaris*, d'Orb. ; DE LORIO, (3). *P. levis*, d'Orb., v. sub. *P. subsulcatus*, Munst. *P. lanceolatus* and *P.*, n. sp., Cretaceous, N. Bohemia ; JAHN, p. 481. *P. liasinus*, d'Orb., v. sub. *Balanocrinus subteroides*, Quenst. *P. scalaris*, Dumortier, v. sub. *P. subsulcatus*, Munst. *P. subsulcatus*, Munst., Toarcian, Portugal ; DE LORIO, (3) pp. 149 & 150, pl. xxvii, figs. 12-14 : synonyms, *P. levis*, d'Orb., *P. scalaris*, Dumortier. *P. vulgaris*, d'Orb., v. sub. *P. jurensis*, Quenst.

*P. wyville-thomsoni*, Jeff., Madeira, 55-700 fath. ; CARPENTER, (3) p. 64.

† ; *P. incallidus*, p. 153, pl. xxvii, figs. 16 & 17, Jurassic, Portugal, *lusitanicus*, pp. 148 & 149, pl. xxvii, figs. 7-11, Upper Lias and Toarcian, Portugal, *penichensis*, p. 152, pl. xxviii, figs. 1-6, Jurassic, Portugal, DE LORIO, (3) : n. spp.

† *Periechocrinus speciosus*, Hall, from Lower Niagara Limestone, Lockport, N. Y. ; RINGUEBERG.

*Phyllocrinus*, d'Orb. : characters of the genus ; JAEKEL, (2) pp. 651-653.

† *P. granulatus*, d'Orb., uncertain locality ; *id.* (2) pp. 654 & 655, taf. xlii, figs. 1 & 2. † *P. hoheneggeri*, Zittel, Neocomian, near Freiburg in Switzerland ; *id.* (2) pp. 653 & 654, taf. xlii, figs. 3-5.

*P. intermedius*, n. sp., *id.* (2) p. 654, taf. xxxvi, fig. 5, Neocomian, Stramberg.

† *Pisocrinus gemmiformis*, S. A. Miller, Lower Silurian, Indiana ; MILLER, (3) pp. 26-29, pl. vi, figs. 10, 11, 12, 24, & 25.

† ; *P. benedicti*, p. 29, pl. vi, figs. 13-16, *campana*, p. 32, pl. ii, figs. 4 & 5, *gorbyi*, pp. 30 & 31, pl. vi, figs. 17-23, Lower Silurian, Indiana, MILLER (3) : n. spp.

† ; *Platycrinus levis*, Miller, from Limestone and Shale, Lanarkshire ; CRAIG, p. 69. *Platycrinus planus*, and sp. ?, from Burlington Limestone ; ROWLEY (2)

† ; *P. absentivus*, pp. 15 & 16, pl. i, fig. 15, *acclivus*, pp. 12 & 13, pl. i, figs. 9 & 10, *aquitermus*, p. 14, pl. i, fig. 13, *æternalis*, pp. 11 & 12, pl. i, fig. 8, Lower Carboniferous, Missouri, MILLER (1) ; *P. alabamensis*, p. 50, pl. ix, fig. 5, Subcarboniferous, Alabama, *id.* (3) ; *P. allophylus*, pp. 9 & 10, pl. i, figs. 3 & 4, Lower Carboniferous, Missouri, *id.* (1) ; *P. altidorsatus*, ROWLEY (4) & HARE, pp. 98 & 99, pl. ii, fig. 2, Upper Burlington Chert, Louisiana, Mo. ; *P. amabilis*, pp. 19 & 20, pl. ii, figs. 9 & 10, *annosus*,

p. 14, pl. i, fig. 12, *latiola*, p. 22, pl. iii, figs. 1 & 2, *blairi*, p. 21, pl. ii, figs. 13 & 14, *boonvillensis*, pp. 8 & 9, pl. i, figs. 1 & 2, *brittsi*, p. 23, pl. iii, figs. 3 & 4, *broadheadi*, pp. 21 & 22, pl. ii, fig. 15, *carchesium*, p. 23, pl. iii, figs. 6 & 7, *concinus*, pp. 18 & 19, pl. iv, fig. 5, Lower Carboniferous, Missouri, MILLER, (1); *P. corbuliformis*, ROWLEY (5) & HARE, p. 113, pl. iii, fig. 1, Lower Burlington Limestone, Louisiana; *P. curryvillensis*, Chouteau Limestone, Missouri, ROWLEY (4) & HARE, pp. 98 & 99, pl. ii, fig. 5; *P. gorbyi*, Lower Carboniferous, Missouri, MILLER, (1) p. 15, pl. i, fig. 14; *P. insolens*, Chouteau Limestone, Missouri, ROWLEY (4) & HARE, p. 98, pl. ii, fig. 4; *P. lautus*, Lower Carboniferous, Missouri, MILLER, (1) pp. 17 & 18, pl. ii, figs. 3 & 4; *P. marginatus*, Upper Burlington Limestone, ROWLEY (4) & HARE, p. 98, pl. ii, fig. 3; *P. occidentalis*, pp. 10 & 11, pl. i, figs. 5 & 6, *ollicula*, p. 19, pl. ii, figs. 7 & 8, *pentagonus*, p. 16, pl. ii, fig. 1, Lower Carboniferous, Missouri, MILLER (1); *P. pisum*, ROWLEY (5) & HARE, pp. 113 & 114, pl. iii, fig. 3, Lower Burlington Limestone, Louisiana; *P. plano-basalis*, *id.* (4) & *id.* p. 98, pl. ii, fig. 1, Burlington Limestone, Missouri; *P. pulcellus*, p. 11, pl. i, fig. 7, *rotundus*, p. 20, pl. ii, figs. 11 & 12, *sampsoni*, p. 13, pl. i, fig. 11, *sulcatus*, pp. 16 & 17, pl. ii, fig. 2, Lower Carboniferous, Missouri, MILLER (1) : n. spp.

†*Platysolenites antiquissimus*, Eichwald, MATTHEW, p. 150, pl. vii, figs. 11a-c, Cambrian, Canada.

†*Pomatocrinus jeegeri*, Kœnig, v. sub. †*Millericrinus mespiliformis* (Schlotheim), d'Orb.

*Porocrinus*, Bill., remarks on the genus; GRANT, (2) p. 42.

†*P. smithi*, n. sp., GRANT, (2) pp. 42 & 43, figs. 1-8.

†; *Poteriocrinus crassus*, Miller, from Limestone and Shale, Lanarkshire; CRAIG, p. 69. *P. crassus*, Miller, and *P. nuciformis*, McCoy, from Calcareous Limestone, STRAHAN, p. 228. *P. meekanus*, from Burlington Limestone; ROWLEY (2).

†; *P. agnatus*, p. 43, pl. viii, figs. 6 & 7, Keokuk Group, Missouri; *P. amœnus*, p. 45, pl. ix, fig. 6, Keokuk Group, Indiana, MILLER (3); *P. arcanus*, MILLER & GURLEY, p. 29, pl. v, fig. 4, *ib.*; *P. boonvillensis*, MILLER, (3) pp. 42 & 43, pl. viii, figs. 3 & 4, Keokuk Group, Missouri; *P. brittsi*, *id.* (1) p. 30, pl. iv, figs. 5 & 6, Lower Carboniferous, Missouri; *P. cantonensis*, MILLER & GURLEY, pp. 40 & 41, pl. viii, figs. 3 & 4, Keokuk Group, Indiana; *P. coryphæus*, MILLER, (3) pp. 44 & 45, pl. ix, fig. 1, *ib.*; *P. crawfordsvillensis*, p. 23, pl. iv, fig. 8, *ib.*, *genista*, pp. 38 & 39, pl. vii, fig. 3, Iowa, *grandilineus*, pp. 22 & 23, pl. iv, fig. 7, Keokuk Group, Indiana, *legrandensis*, pp. 39 & 40, pl. vii, figs. 4-6, *scopæ*, p. 38, pl. vii, fig. 2, *spartarius*, p. 37, pl. vii, fig. 1, Kinderhook Group, Iowa, *subramosus*, pp. 49 & 50, pl. x, fig. 1, *verus*, p. 24, pl. iv, fig. 9, Keokuk Group, Indiana, MILLER & GURLEY; *P. waltersi*, ROWLEY (4) & HARE, p. 101, pl. ii, fig. 15, Lower Burlington Limestone, Louisiana, Mo. : n. spp.

†*Rhodocrinus uniarticulatus*, de Kon., Limestone and Shale, Lanarkshire; CRAIG, p. 69.

†; *R. calatus*, p. 43, pl. vii, fig. 10, Kinderhook Group, Iowa, MILLER & GURLEY; *R. parvus*, p. 39, pl. v, figs. 8 & 9, Lower Carboniferous,



Missouri, MILLER (1); *sculptus*, pp. 42 & 43, pl. vii, fig. 11, Kinderhook Group, Iowa, MILLER & GURLEY : n. spp.

†*Saccocrinus gorbyi*, n. sp., MILLER, (3) p. 57, pl. ix, figs. 2 & 3, Niagara Group, Indiana.

†; *Scaphiocrinus bellus*, pp. 46 & 47, pl. viii, figs. 5–7, *biserialis*, p. 52, pl. ix, fig. 1, pl. x, fig. 2, *bonoensis*, pp. 29 & 30, pl. v, figs. 6 & 7, Keokuk Group, Indiana, MILLER & GURLEY; *S. boonvillensis*, pp. 37 & 38, pl. v, figs. 1 & 2, *constrictus*, pp. 38 & 39, pl. v, figs. 3 & 4, Lower Carboniferous, Missouri, MILLER (1); *S. gorbyi*, pp. 46 & 47, pl. xii, fig. 15, Keokuk Group, Missouri, *id.* (3); *S. granuliferus*, p. 51, pl. x, fig. 3, *graphicus*, p. 51, pl. x, fig. 3, *lacunosus*, p. 47, pl. viii, figs. 8–10, *manus*, pp. 24 & 25, pl. iv, fig. 13, Keokuk Group, Indiana, MILLER & GURLEY; *S. porrectus*, MILLER (3) (= *S. robustus*, Hall?), p. 42, pl. vii, fig. 2, Keokuk Group, Indiana; *S. præmorsus*, p. 46, pl. viii, fig. 11, *repertus*, p. 45, pl. viii, figs. 1 & 2, Keokuk Group, Indiana, MILLER & GURLEY; *S. sampsoni*, MILLER, (3) p. 46, pl. ix, fig. 12, Subcarboniferous, Missouri : n. spp.

†*Sclerocrinus*, n. g., for †*Eugeniocrinus cidaris*, v. Quenst., †*E. compressus*, Goldf., pp. 621 & 622; †*S. strambergensis*, n. sp., pp. 623, 626, & 670, taf. xxxvii & xxxviii, Neocomian of Stramberg and Nesselsdorf; JAEKEL (2). *S. compressus*, Goldf. sp.; *id.* (2) pp. 626, 627, & 670, Jurassic, Stuttgart.

*Sicyocrinus*, Ang., united with *Botryocrinus*, Ang.; BATHER (2).

†*Solunocrinus scrobiculatus*, Munst., from the lower Malm of Böllastfelsen; JAEKEL, (2) taf. xliii, fig. 3.

†*Spyridiocrinus*, n. g., for †*S. cheuxi*, n. sp.; EHLERT, (1) pp. 220–227, pls. vii & viii, and figs. 1–3 in the text, Devonian Limestone, Angers.

†*Stephanocrinus osgoodensis*, S. A. Miller, Lower Silurian, Indiana; MILLER, (3) pp. 22 & 33, pl. vi, figs. 1–4.

†; *S. elongatus*, p. 24, pl. vi, fig. 5, *hamellii*, pp. 25 & 26, pl. vi, figs. 7–9, *obpyramidalis*, p. 24, pl. vi, fig. 6, Lower Silurian, Indiana, MILLER (3) : n. spp.

†*Symbathocrinus blairi*, n. sp., MILLER, (1) pp. 32 & 33, pl. iv, figs. 13–15, Lower Carboniferous, Missouri.

†*Taxocrinus subovatus*, n. sp., MILLER & GURLEY, pp. 26 & 27, pl. v, fig. 3, Keokuk Group, Indiana.

†*Tetanocrinus*, n. g., for †*Eugeniocrinus aberrans*, de Lor.; JAEKEL, (2) pp. 628–630, fig. 15, Oxfordian of Ardèche [v. sub. *Dolichocrinus*].

*Tetracrinus* and the so-called *Eugeniocrinidae* from the Lias, remarks on : JAEKEL, (2) pp. 658 & 659.

†*Thenarocrinus callipygus*, Bather, description added to; BATHER, (1) pp. 35 & 36, pl. i, figs. 1–3.

†*T. gracilis*, n. sp., BATHER, (1) pp. 36–40, pl. i, figs. 4 & 5.

†; *Thiolliericrinus insuetus*, pp. 167 & 168, pl. xxix, figs. 23–29, *ribeiroi*, de Lor., Lusitanian, Portugal, DE LÓRIOL, (3) pp. 165 & 166, pl. xxix, figs. 16–22, n. spp.

†*Tormocrinus veronensis*, n. g. & sp., JAEKEL, (2) pp. 657 & 658, taf. xlii, fig. 6, Eocene, Upper Italy.

*Tricalocrinus*, from Burlington Limestone; ROWLEY (2).

† *Ulocrinus*, n. g., pp. 6 & 7; type, † *U. buttsi*, pp. 7 & 8, pl. i, figs. 5 & 6, Upper Coal Measures, † *U. kansasensis*, pp. 8 & 9, pl. i, figs. 7-10, n. spp., Kansas City, Missouri; MILLER & GURLEY. † *U. sp.*, *iid.* pp. 54 & 55, pl. x, fig. 9.

*Vasocrinus* (1857), perhaps not distinguishable from *Botryocrinus* (1878); BATHER (2).

†; *Z. commaticus*, MILLER, (1) pp. 36 & 37, pl. v, figs. 10 & 11, Lower Carboniferous, Missouri, and Keokuk Group, Missouri; MILLER, (3) p. 44, pl. viii, fig. 8; *Z. dubius*, MILLER & GURLEY, pp. 44 & 45, pl. vii, figs. 7 & 8, Keokuk Group, Indiana; *Z. faggi*, ROWLEY (4) & HARE, p. 103, pl. ii, fig. 20, Upper Burlington Limestone, Mo.; *Z. pocillum*, MILLER, (1) p. 28, pl. iv, figs. 1 & 2, Lower Carboniferous, Missouri: n. spp.

*Zophocrinidae*, n. fam. for *Zophocrinus*, n. g.; MILLER, (3) p. 32.

† *Zophocrinus*, n. g., p. 32, for † *Z. howardi*, n. sp., pp. 33 & 34, pl. vi, figs. 26-28, Lower Silurian, Indiana; MILLER (3).

## 7. CYSTIDEA.

*Cystidea* of Trenton Formation; AMI, (1) pp. 57 & 58.

† *Agelacrinites dicksoni*, figured; GRANT, (2) fig. 9 on pl.

† *Amygdalocystites storealis*, n. var. *laevis*; BILLINGS, (3) pp. 51 & 52, 2 figs., Trenton Limestone.

*Caryocrinus*, from Sweden; see HOLM. † *C. ornatus*, Say, from Lower Niagara Limestone, Lockport, N. Y.; RINGUEBERG.

† *C. indianensis*, n. sp., MILLER, (3) pp. 19 & 20, pl. v, figs. 9 & 10, Lower Silurian, Indiana.

† *Comarocystites punctatus*, Billings, figured; GRANT (1).

† *Echinospharites kingi*, n. sp. [non descr.], NÖETLING, p. 79, Shan Hills, Burmah.

† *Ecocystites*? sp. from Cambrian of Sardinia; BORNEMANN, (8) p. 433.

† *E. sp.*, Lower Cambrian, Nevada; WALCOTT, (2) p. 607, pl. lx, fig. 3.

† *Heterocystites armatus*, Hall, from Lower Niagara Limestone, Lockport, N. Y.; RINGUEBERG.

†; *Holocystites adipatus*, p. 13, pl. ii, figs. 1 & 2, *benedicti*, p. 17, pl. v, fig. 3, *colletti*, p. 16, pl. iv, fig. 3, *commodus*, p. 14, pl. iii, figs. 1, 2, 5 & 6, *gorbyi*, p. 14, pl. ii, figs. 3 & 4, *indianensis*, p. 15, pl. iii, fig. 7, *madisonensis*, p. 15, pl. iii, figs. 3 & 4, *ornatissimus*, p. 17, pl. v, figs. 1 & 2, *papulosus*, p. 18, pl. v, figs. 7 & 8, *parvulus*, p. 18, pl. v, fig. 6, *parvus*, p. 16, pl. iv, figs. 4 & 5, *scitulus*, p. 14, pl. ii, figs. 5 & 6, *spangleri*, pp. 16 & 17, pl. iv, fig. 6, *subovatus*, pp. 17 & 18, pl. v, figs. 4 & 5, *wyckoffi*, p. 15, pl. iv, figs. 1 & 2, Lower Silurian, Indiana, MILLER (3): n. spp.

† *Lichenocrinus crateriformis*, Hall, from Trenton Limestone, Ottawa; BILLINGS, (1) p. 34.

† *Pleurocystites jiliteuxus*, Bill., from Trenton Limestone, Ottawa; BILLINGS, (1) p. 34.

*Stribalocystidae*, n. fam., for *Stribalocystites*, n. g.; MILLER, (3) p. 20.

† *Stribalocystites*, n. g., for † *S. tumidus*, n. sp.; MILLER, (3) pp. 20 & 21, pl. vi, figs. 33 & 34, Lower Silurian, Indiana.

*Trochocystites barrandei*, n. sp., MUN.-CHALM. & J. BERG., in BERGERON, p. 338, pl. iii, fig. 6.

## 8. BLASTOIDEA.

†; *Codaster gracillimus*, p. 99, pl. ii, figs. 6 & 7, Lower Burlington Limestone, Mo., *grandis*, p. 99, pl. ii, fig. 8, Upper Burlington Chert, Louisiana, Mo., ROWLEY (4) & HARE, n. spp.

†; *Codonites inopinatus*, n. sp., ROWLEY (4) & HARE, pp. 100 & 101, pl. ii, figs. 11 & 12, Lower Burlington, Louisiana, and ROWLEY (5) & HARE, p. 118, pl. iii, fig. 17. *C. stelliferus*, from Burlington Limestone; ROWLEY (2).

† *Cryptoblastus melo*, from Burlington Limestone; ROWLEY (2).

†; *Granatocrinus aplatus*, p. 117, pl. iii, figs. 11 & 12, *concinulus*, pp. 117 & 118, figs. 13 & 14, Lower Burlington Limestone, Louisiana, ROWLEY (5) & HARE; *G. excavatus*, pp. 99 & 100, pl. ii, figs. 9 & 10, Burlington Limestone, Mo., *exiguus*, ROWLEY (4) & HARE, p. 100, pl. ii, figs. 13 & 14, Lower Burlington Limestone, Louisiana, Mo.; *G. exiguus*, from Sub-carboniferous, Mo., ROWLEY (5) & HARE, p. 118, pl. iii, fig. 18.

† *G. pyriformis*, ROWLEY (5) & HARE, p. 118, pl. iii, figs. 15 & 16, Upper Burlington Limestone, Marion Co., Mo.: n. spp.

† *Phænoschisma* (*Pentremites*) *acutum*, Phil, from Black Limestone; STRAHAN, p. 228.

† *Troostocrinus nitidulus*, n. sp., MILLER & GURLEY, p. 58, pl. ix, figs. 14 & 15, pl. x, fig. 14, St. Louis Group, Indiana.



# VERMES.

BY

ARTHUR WILLEY, B.Sc. Lond.

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I.—LIST OF PUBLICATIONS, p. 1.

II.—FAUNISTIC, p. 26.

III.—THE GENERAL SUBJECT ; including ANATOMY and BIOLOGY, which are distributed throughout the Systematic arrangement, pp. 27-50.

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In addition to the works of which a longer or shorter abstract is given below, the following should be specially mentioned on account of their importance, though not lending themselves to brief abstracts:—On the histology of the nervous system, BIEDERMANN, BÜRGER (5), RETZIUS (1, 2), and ROHDE ; development and biology of Rotifers, ZELINKA ; development of the *Gordiidae*, VILLOT ; and biology of the littoral zones, VAILLANT.

## I.—LIST OF PUBLICATIONS.\*

ANDREWS, E. A. (1) On the Eyes of *Polychæta*. A preliminary communication. Zool. Anz. xiv, No. 371, pp. 285 & 286.

Author observes that in the branchial eyes of some sedentary Annelids the retinal cells are separated by intervening pigment cells, and each bears its own refracting medium at its cuticular end. Such an eye is therefore practically "compound." (See next memoir for details.)

——. (2) Compound Eyes of Annelids. J. Morph. v, pp. 271-299, 2 pls.

——. (3) Reproductive Organs of *Diopatra*. T. c. pp. 113-124, pls. vii & viii.

In two species of *Diopatra* (*D. magna*, n. sp., and *D. cuprea*, Bosc.) the ova possess during a long period of their growth, both while in the ovary and while free in body-cavity, two cell-strings, often branching, and composed of from fifteen to forty ovarian cells each. Function of these cell-

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\* An asterisk prefixed to a quotation signifies that the Recorder has not seen the Journal or Work referred to.

strings unknown. They are attached to one pole of the ovum and are compared to the similarly placed cell-mass in ovum of *Bonellia*.

[ANDREWS, E. A.] (4) Report upon the *Annelida Polychæta* of Beaufort, North Carolina. P. U. S. Nat. Mus. xiv, pp. 277-302, pls. xii-xviii. 8 new species.

— (5) The Distribution of *Magelona*. Johns Hopk. Univ. Circ. x, No. 88, p. 96.

*Magelona papillicornis* has been recorded from coasts of Brazil, Normandy, Britain; and author has found young pelagic individuals at Beaufort, N.C., and the adult at Woods Holl, Mass. Author thinks that the wide distribution of the adult *Magelona*, living, as it does, buried in the sand, is to be explained by the long duration of a pelagic larval stage capable of transport by ocean currents.

— (6) A Commensal Annelid. Am. Nat. xxv, pp. 25-35, pls. i & ii.

*Polydora commensalis*, n. sp., bores a tunnel for itself in the columella of the shell of the Gastropod *Ilyanassa obsoleta*, which is also used by the hermit crab, *Eupagurus longicarpus*.

ΑΡΑΪΤΗΥ, S. (1) *Pseudobranchellion margói* (nova Familia Hirudinearum). Orvos-termesz. Értesítő. 1890, pp. 110-113 in Czech, pp. 122-127 in German.

The new family is called the *Chelyobdellidae*, and comes between the *Ichthyobdellidae* and *Clepsinidae*, in the group of the *Rhynchobdellidae*. The whole material obtained by author (several hundred specimens) was taken from one individual of *Thalassochelys corticata* in the Bay of Naples.

— (2) Keimstreifen und Mesoblaststreifen bei Hirudineen. Zool. Anz. xiv, pp. 388-393. Correction on p. 436.

Author maintains his view, in opposition to Bergh, that the germinal bands—that is to say, the three cell-rows on either side of the middle line of the embryo—are all employed in the formation of the nervous system.

— (3) Ueber die "Schaumstruktur" hauptsächlich bei Muskel- und Nervenfasern. Biol. Centralbl. xi, No. 3, pp. 78-87, Nachtrag No. 4, pp. 127 & 128.

Observations based on structure of muscular and nervous elements of *Pontobdella muricata*.

ARSTEIN, C. (1) *Vanadis fasciata*, eine neue Alciopide. Zool. Jahrb. Abth. f. Syst., &c., Bd. v, pp. 543-545, Taf. xxxviii.

— (2) Die Alciopiden des naturhistorischen Museums in Hamburg. JB. Hamb. viii, 1890, 19 pp., 1 pl.

1 new genus and 3 new species.

BARROIS, T. Sur la présence du *Lumbricus (Photodrilus) phosphoreus* Dugès à Groffliers (Pas-de-Calais). Rev. Biol. iii, No. 3, pp. 117-119.

- BEDDARD, F. E. (1) On an Earthworm of the Genus *Siphonogaster*, from West Africa. P. Z. S. 1891, pt. 1, pp. 48-52, 3 figs.  
*S. millsoni*, n. sp., Yoruba country, Lagos.
- (2) Preliminary Account of an Earthworm from West Africa referable to a new Genus. T. c. pp. 172-176.  
*Libyodrilus violaceus*, n. g. & sp., Lagos. Gives a list of Central and South African Earthworms.
- (3) Preliminary Notice of a new form of Excretory Organs in an Oligochæteous Annelid. P. R. Soc. xlix, pp. 308-310.
- (4) On the Structure of an Earthworm allied to *Nemertodrilus*, Mich., with Observations on the Post-Embryonic Development of Certain Organs. Q. J. Micr. Sci. xxxii, pp. 539-586, pls. xxxviii & xxxix.  
 The worm is *Libyodrilus violaceus*.
- (5) Anatomy of *Oenerodrilus*. Tr. R. Soc. Edinb. xxxvi, pt. 2, pp. 563-583, 1 pl.  
 Suggests formation of new family, *Oenerodrilidæ*.
- (6) New Genera of Aquatic *Oligochæta*. T. c. pp. 273-305, 3 pls.  
*Phreodrilus* and *Pelodrilus*. New family, *Phreodrilidæ*.
- (7) Abstract of some Investigations into the Structure of the *Oligochæta*. Ann. N. H. (6) vii, pp. 88-96, 2 woodcuts.  
 Criticises Benham's "Attempt to Classify Earthworms."
- (8) On the Structure of Two new Genera of Earthworms belonging to the *Eudrilidæ*, and some remarks on *Nemertodrilus*. Q. J. Micr. Sci. xxxii, pp. 235-278, pls. xvi-xx.  
*Hyperiodrilus* and *Heliiodrilus*.
- (9) Observations upon the Structure of a Genus of *Oligochæta* belonging to the *Limicoline* Section. Tr. R. Soc. Edinb. xxxvi, pt. 1, pp. 1-17, 1 pl.  
 Anatomical and general on *Moniligaster barwelli*.
- ° — (10) Zoological Notes. II. Aquatic Earthworms. P. Phys. Soc. Edinb. x, pt. 2, pp. 208-210.
- ° — (11) The Classification and Distribution of Earthworms. T. c. pp. 235-290, 2 pls.
- BELL, F. J. Description of a new Species of *Tristomum* from *Histiophorus brevirostris*. Ann. N. H. (6) vii, pp. 534 & 535.
- BENEDEN, P. J. VAN. Un *Nématode* nouveau d'un *Galago* de la côte de Guinée. Bull. Ac. Belg. (3) xix, 1890, pp. 389-393, 1 pl.  
*Strongylus otolicni*, n. sp., from intestine of *Otolicnus peli*. (See critical summary by G. BRANDES, in CB. Bakt. Parasit. ix, pp. 509 & 510.)

BENHAM, W. B. (1) The Nephridium of *Lumbricus* and its blood supply; with remarks on the Nephridia in other *Chaetopoda*. Q. J. Micr. Sci. xxxii, pp. 293-334, pls. xxiii-xxv, 3 woodcuts.

— (2) Report on an Earthworm collected for the Natural History Department of the British Museum, by Emin Pasha, in Equatorial Africa. J. R. Micr. Soc. 1891, pt. 2, pp. 161-168, pls. iii & iv.

*Eminia equatorialis*, n. g. & sp., one of the *Geoscolecidae*.

— (3) Note on a Couple of Abnormalities. Ann. N. H. (6) vii, pp. 256-258, pl. iii.

One of the cases relates to a specimen of *Lumbricus herculeus*, Sav., which showed an asymmetrical disposition of the external genital pores and of the spermathecae.

— (4) Notes on some Aquatic *Oligochaeta*. Q. J. Micr. Sci. xxxiii, pt. 1, pp. 187-218, pls. v-vii.

Includes biological observations on and fresh description of *Heterochaeta costata*, Clap., and comparison with other *Tubificidae*. Notes on *Spirosperma ferox*, Eisen, obtained from Thames and Cherwell. Note on *Psammoryctes* and the Chaetae of *Tubifex rivulorum*. Description of a new species of *Stylodrilus*, and notes on budding of *Nais elinguis*, O. F. M.

BERGH, R. S. Neue Beiträge zur Embryologie der *Anneliden*. II. Die Schichtenbildung im Keimstreifen der *Hirudineen*. Z. wiss. Zool. Bd. 52, Taf. 1-17, Taf. i & ii.

BERGMANN, W. Ueber den Befund eines *Ascaris lumbricoides* in der Peritonealhöhle. Prager med. Wochenschrift. 1890, No. 50. Cf. CB. Bakt. Parasit. x, p. 259.

BIEDERMANN, W. Ueber den Ursprung und die Endigungsweise der Nerven in den Ganglien wirbelloser Thiere. Jen. Z. Nat. xxv, pp. 429-466, Taf. xvii-xxiii.

Investigation of the course of the fibres in the ventral ganglia of various *Invertebrata*, including *Hirudo medicinalis* (pp. 434-449) and *Nereis pelagica* (pp. 450-453), by means of the method of Ehrlich.

BITOT AND SABRAZÉS. Étude sur les cysticerques en grappe de l'encéphale et de la moëlle chez l'homme. (Gazette méd. de Paris, 1890, Nos. 27-30.) CB. Bakt. Parasit. ix, pp. 625-627.

BLANCHARD, R. (1) Nouveau cas de Ténia nain (*Hymenolepis nana*) en Amérique. Bull. Soc. Z. Fr. xvi, pp. 165-167.

Upwards of thirty parasites found in intestine of an Argentine sailor, at Buenos Ayres, this being the second time that this *Tenia* has been observed in America.

— (2) Note sur les migrations du *Tenia gracilis*, Krabbe. T. c. pp. 119-122.

The true intermediate host of *T. gracilis* is *Candona rostrata*, and probably other Ostracods; and the final host, the duck. Von Linstow



has found the cysticeroid in *Perca fluviatilis*, but author considers its presence here as being purely adventitious. In an appended note it is stated that Alois Mrázek has found the same cysticeroid in *Cypris compressa*, Baird, and *Cyclops viridis*, Fischer.

[BLANCHARD, R.] (3) Courtes notices sur les Hirudinées. 1. Sur la sangsue de Cheval du Nord de l'Afrique (*Limnatis nilotica*, Savigny, 1820). *T. c.* pp. 218–221; also in C.R. Soc. Biol. iii, pp. 693–696.

When horses drink from the rivers of the north of Africa, they are often attacked by these leeches, which penetrate deep into the pharynx.

——. (4) Notices Helminthologiques (2<sup>me</sup> série). Mém. Soc. Zool. iv, pp. 420–489, figs. in text.

vi. Sur les Téniaïdés à ventouses armées. Genres *Echinocotyle*, *Davainea*, et *Ophrycotyle*, pp. 420–443.

Synopsis of the species of these genera, with long descriptions of some of them.

vii. Cestodes du Groupe des *Anoplocephalinae*, pp. 443–450.

New subfamily comprising three genera: *Moniezia*, n. g., *Anoplocephala*, Ém. Blanch., 1868, and *Bertia*, R. Blanch., 1891. *Moniezia* is a new genus for several old species of *Tænia*. *Anoplocephala* = *Plagotænia*, Peters, 1871.

viii. Sur les *Moniezia* des Rongeurs, pp. 452–466.

The three species of *Dipylidium* (viz., *D. leuckarti*, *D. pectinatum*, and *D. latissimum*) which Riehm formed out of *Tænia pectinata*, Goeze, in 1881, are transferred to genus *Moniezia*.

For remaining Notes, see General Subject, hereafter, pp. 44, 47, 48.

——. (5) Sur les Helminthes des Primates Anthropoïdes. (1<sup>re</sup> Note—Cestodes.) *T. c.* pp. 186–196.

New genus, *Bertia*.

——. (6) Identité du *Distoma clavatum*, Rudolphi, et du *Distoma ingens*, Moniez. C.R. Soc. Biol. (9) iii, pp. 692 & 693.

See, however, MONIEZ, Notes, No. 10.

——. (7) Note sur quelques vers parasites de l'homme. *T. c.* pp. 604–615.

Cases of *Distomum hepaticum* and *D. sinense*, Cobb.; also *Cestodes*.

——. (8) Note préliminaire sur le *Distoma heterophyes*, Parasite de l'homme en Egypte. *T. c.* p. 791.

\*——. (9) Histoire zoologique et médicale des Téniaïdes du genre *Hymenolepis*, Weinl. Paris: 1891, 8vo, 112 pp., 21 figs.

BLES, E. J. Report on Occupation of Table of British Association at the Zoological Station of Naples. Rep. Brit. Ass. 61st Meeting, 1891, pp. 373–377.

Anatomy of the *Chlorhæmidæ*. Deals with organisation of *Siphonostoma* 1891. [VOL. XXVIII.] F 7

*diplochætos*, Otto. Author thinks the *Chlorhæmidæ* (in which only a single pair of thoracic nephridia are present, and no abdominal nephridia) represent *Tubicola*, which have secondarily acquired an errant habit.

BLESSIG, E. Zur Kasuistik der subkonjunktivalen Cysticerken. (St. Petersburger med. Wochenschrift, 1890, No. 40.) CB. Bakt. Parasit. ix, p. 384.

BOLSIUS, H. (1) Nouvelles recherches sur la structure des organes segmentaires des Hirudinées. Cellule, vii, Fasc. 1, pp. 3-77, 3 pls.

— (2) Les Organes ciliés des Hirudinées. T. c. Fasc. 2, pp. 291-320, 2 pls.

BOURNE, A. G. (1) On *Megascolex cæruleus*, Templeton, from Ceylon; together with a Theory of the Course of the Blood in Earthworms. Q. J. Micr. Sci. xxxii, pp. 49-87, pls. vi-ix.

*Megascolex cæruleus* = (*Pleurochæta moseleyi*, Beddard).

— (2) Notes on the Naidiform *Oligochæta*; containing a description of New Species of the Genera, *Pristina* and *Pterostylarides*, and remarks upon Cephalization and Gemmation as generic and specific Characters in the Group. T. c. pp. 335-356, pls. xxvi & xxvii.

BRANDES, G. (1) Die Familie der *Holostomiden*. Zool. Jahrb. Abth. f. Syst. v, 1890, pp. 549-604, Taf. xxxix-xli.

Anatomical, pp. 550-570. Developmental, pp. 570-575. Systematic, pp. 575-596. 11 new species.

— (2) Zur Frage des Begattungsaktes den entoparasitischen *Trematoden*. Kritische Bemerkungen zu Pintner's Aufsatz. CB. Bakt. Parasit. ix, pp. 264-267.

See below, PINTNER (1).

— (3) Einige Bemerkungen zu Vorstehendem. T. c. pp. 730 & 731.

See below, PINTNER (1).

BRAUN, M. (1) Helminthologische Mittheilungen. T. c. pp. 52-56.

Account of work done in author's laboratory. See DIECKHOFF.

— (2) Ueber *Echinorhynchus polymorphus* und *filicollis*. T. c. pp. 375-380.

Author decides above to be distinct species.

— (3) Die sogenannte "freischwimmende" Sporocyste. Op. cit. x, pp. 215-219.

Author obtained a number of the so-called free-swimming Sporocysts (which had been described in 1885 by Ramsay Wright) from *Limnæus palustris*, var. *corvus*. They are really, however, *Cercariæ*, with bifurcated tail, of which the anterior portion—i.e., the *Distomum*-body—is withdrawn into a cup-like depression of the tail. Author has not determined the species of *Distomum*, but names the *Cercaria*—*C. mirabilis*, n. sp.

[BRAUN, M.] (4) Bericht über die Fortschritte in der thierischen Parasitenkunde. *T. c.* : B. *Trematodes*, pp. 421-427; C. *Cestodes*, pp. 427-430 & 465-471; D. *Nematodes*, pp. 493-495; E. *Acanthocephala*, pp. 495-497; F. *Annelids*, pp. 497 & 498.

——. (5) Verzeichniss von Eingeweidewürmern aus Mecklenburg. *Arch. Ver. Mecklenb.* 1891, pp. 97-117.

\*BRYCE, D. *Distyla*; New Rotifers. *Sci. Goss.* 1891, pp. 204-207, 8 figs. 3 new species.

BURCKHARDT, R. Weitere Mittheilungen über *Protopterus annectens* und über einen in seiner *Chorda dorsalis* vorkommenden Parasiten (*Amphistomum chordale*, n. sp.). *SB. nat. Fr.* 1891, pp. 62-64.

BÜRGER, O. (1) Beiträge zur Entwicklungsgeschichte der *Hirudineen*. Zur Embryologie von *Nephelis*. *Zool. Jahrb. Abth. f. Anat. &c*, iv, pp. 697-738, Taf. xli-xliii.

——. (2) Ueber Attractionssphären in den Zellkörpern einer Leibesflüssigkeit. *Anat. Anz.* vi, pp. 484-489, 5 figs.

The large corpuscles of the rhynchocoelom (coelom of introvert) of the *Nemertines* which do not undergo division, and whose nuclei are therefore in a permanent resting condition, contain each an attraction-sphere with central body. Only twice were double spheres observed. Species of *Amphiporus* (one new) were examined.

——. (3) Vorläufige Mittheilungen über Untersuchungen an *Nemertinen* des Golfes von Neapel. *Nachr. Ges. Götting.* 1891, No. 9, 16 pp.

——. (4) Die Enden des excretorischen Apparates bei den *Nemertinen*. Eine Mittheilung. *Z. wiss. Zool.* liii, pp. 322-333, Taf. xvi.

——. (5) Beiträge zur Kenntniss des Nervensystems der Wirbellosen. Neue Untersuchungen über das Nervensystem der *Nemertinen*. *MT. z. Stat. Neap.* x, pp. 206-254, Taf. xiv & xv.

Investigation with the Methyl-blue method of Ehrlich.

——. (6) Zur Kenntniss von *Nectonema agile*, Verr. *Zool. Jahrb. Abth. f. Anat. &c.*, iv, pp. 631-652, Taf. xxxviii.

This is an isolated free-living Nematode from Vineyard Sound. The curious structure of nervous system and absence of lateral fields relate it to *Gordius*, while the musculature and digestive apparatus ally it to *Trichocephalus*.

\*BURN, W. B. Some new and little-known Rotifers. *Am. Micr. J.* xii, No. 7, pp. 145-147, 1 pl.

2 new species.

CHATIN, J. (1) Sur Paiguillon de l'*Heterodera schachtii*. *C.R.* cxii, No. 26, pp. 1516-1518.

——. (2) Sur la présence de l'*Heterodera schachtii* dans les cultures d'œillet à Nice. *Op. cit.* cxiii, pp. 1066 & 1067.

CHIGI, L. Organi escretori e Glandole tubipare delle Serpulacee. Tesi di Laurea. Foligno (F. Salvati): 1890, 103 pp., 15 pls.

Comes to similar conclusions as Soulier (see below) as to the part played by the ventral shields in forming the tube.

COBB, N. A. (1) *Anticoma*: A genus of free-living marine Nematodes. P. Linn. Soc. N.S.W. v, pp. 765-774, 2 woodcuts.

1 new species.

—. (2) *Onyx* and *Dipeltis*: new Nematode genera, with a note on *Dorylaimus*. Op. cit. vi, pp. 143-158, 9 figs.

COBELLI, R. Contribuzione allo studio dei Rotiferi. Verh. z.-b. Wien, 1891, Bd. 41, pp. 585 & 586.

On the desiccation of Rotifers. Rotifers kept in dried earth for over five years were dead, but on immersion in water distended themselves, and showed distinctly the internal organs well preserved. Disaggregation ensued after the distension, the latter being due to the imbibition of water.

COLLIN, A. (1) Parasiten aus dem Darm des Zebra. SB. nat. Fr. 1891, pp. 85-88.

—. (2) Ueber *Planaria alpina*, Dana. T. c. pp. 177-180.

Records a new habitat, viz., the Harz. *Planaria abscissa*, Ijima, is identical with *P. alpina*. Doubtful whether *P. alpina* is viviparous.

—. (3) Ein seltener Fall von Doppel-bildung beim Regenwurm (*Lumbricus* sp.). Naturw. Wochenschr. vi, No. 12, pp. 113-115, 3 figs.

—. (4) Ueber *Echiurus chilensis*, Max Müller. Zool. Anz. xiv, pp. 463 & 464.

This form is allied to *E. uncinatus*, Drasche, as it has only one circle of bristles at hinder end. It has three pairs of segmental organs, this being the only species of *Echiurus* yet described with more than four nephridia.

CORI, C. J. Untersuchungen über die Anatomie und Histologie der Gattung *Phoronis*. Z. wiss. Zool. li, 1890, pp. 480-568, Taf. xxii-xxviii

For the purposes of the Zoological Record, *Phoronis* is regarded provisionally as a Gephyrean.

COSMOVICI, L. C. Un enkystement inconnu du *Distomum lanceolatum*, Mehl. Le Nat. xiii, 1891, p. 247.

See however MONIEZ, Notes, &c., No. ix.

CRETY, C. Cestodi della *Coturnix communis*, Bonn. Boll. Mus. Zool. Anat. Comp. Torino, v, 1890, No. 88, 16 pp., 1 pl.

2 new species.

—. [See also MONTICELLI & CRETY, *infra*.]

CUÉNOT, L. Études sur le sang et les glandes lymphatiques dans la série animale. Arch. Z. expér. ix.

*Polychæta*, pp. 410-447; *Oligochæta*, pp. 447-458; *Hirudinea*, pp. 458-475, pls. xvi-xviii; *Gephyrea*, pp. 593-613; Résumé, pp. 641-656, pl. xxiii.

CUNEO, G. Cenni statistici e corologici sull' echinococco dell' Uomo in Italia. Studii fatti nel Lab. di Zool. dell' Univ. di Genova, 1889-90, 19 pp.

DADAY, E. v. (1) Beiträge zur mikroskopischen Süsswasserfauna Ungarns. Term. füzetek, xiv, 1891, pp. 107-123, Taf. i.

Lists of Rotifers from different localities of Hungary, and observations on their distribution; distinguishing between shore-dwellers and pelagic species, &c., &c. In two different localities author found *Brachionus margói*, Dad., under two forms, viz., in one case with "Panzerfortsätze," and in the other without. These are not two varieties, but form an instance of Dimorphismus or Heterogenesis (see p. 118). Also records *Microstoma lineare*, Oerst.

— (2) Die Räderthiere des Golfes von Neapel. Math. Nat. Ber. Ung. 1891, pp. 349-353.

Extract from a work in Magyar, recorded last year.

— (3) *Schizocerca diversicornis*, Daday, oder *Brachionus amphifurcatus*, Imhof? Eine synonymische Bemerkung. Zool. Anz. xiv, pp. 266-268. Also in Term. füzetek, xiv, pp. 93-95.

Claims priority and correct diagnosis for *Schizocerca*.

\*DALLA-TORRE, K. W. VON. Studien über die mikroskopische Thierwelt Tirols. I Theil. *Rotatoria*. Z. Ferdinand. Tirol Vorarlberg, 3rd Folge, Heft 33, pp. 239-252.

\*DAVISON, C. Work done by Lobworms. Geol. Mag. viii, pp. 489-493.

DENDY, A. (1) On the Victorian Land Planarians. Tr. R. Soc. Vict. 1890, pp. 65-80, pl. vii.

11 new species.

— (2) Additional Observations on the Victorian Land Planarians. *Op. cit.* 1891, pp. 25-41, pl. iv.

2 new species.

— (3) Short Descriptions of new Land Planarians. P. R. Soc. Vict. 1891, pp. 35-38.

3 new species and some new varieties.

— (4) On the Presence of Ciliated Pits in Australian Land Planarians. *T. c.* pp. 39-46, pl. v.

Describes a series of ciliated pits situated in a line on each side of the ventral aspect of the head, beneath the line of eyes—similar to those described by Moseley for *Bipalium*.

DIECKHOFF, C. Beiträge zur Kenntniss der ektoparasitischen Trematoden. Arch. f. Nat. 57th Jahrg., pp. 245-276, Taf. ix.

Confirms the presence of a canalis vitello-intestinalis (first described by Ijima, Zool. Anz. 1884) communicating between the oviduct and

intestine in several species of *Trematodes*. Author says this canal can have no great importance, as it is absent from many ectoparasitic and all endoparasitic *Trematodes*.

FAGGIOLI, F. Della pretesa Reviviscenza dei Rotiferi. Atti Soc. Ligust. Genova, ii, 47 pp., pl. viii.

FEWKES, J. W. Zoological Excursions. I. New *Invertebrata* from the Coast of California. Bull. Ess. Inst. xxi, 1889, 50 pp., 8 pls.  
*Annelida*, pp. 34-38, pl. vii. 3 new species.

FRANCAVIGLIA, M. C. Contributo allo studio della *Tenia litterata*. Lo Spallanzani, Roma, xx, ser. 2, 1891, pp. 384-393, 1 pl.  
240 examples taken from small intestine of a *Vulpes melanogaster*.

FRENZEL, J. (1) Untersuchungen über die mikroskopische Fauna Argentinienens. *Salinella salve*, nov. gen., nov. spec. Ein vielzelliges, infusorienartiges Tier (Mesozoon). Arch. f. Nat. 58th Jahrg. Heft. 1, Dec. 1891, pp. 66-96, Taf. vii. See also Vorläufige Mittheilung Zool. Anz. xiv, pp. 230-233.

— (2) Das Mesozoon *Salinella*. Biol. Centralbl. xi, No. 19, pp. 577-581.

— (3) Untersuchungen über die mikroskopische Fauna Argentinienens. Vorläufiger Bericht. Arch. mikr. Anat. Bd. 38, pp. 1-24, Taf. i.  
Chiefly on *Protozoa*; refers briefly to Worms at end, pp. 21-24. *Turbellaria*, *Rotifera*, *Naidæ*, and *Gastrotricha*.

— (4) Die Verdauung lebenden Gewebes und die Darmparasiten. Arch. Anat. Phys. (Phys. Abth.) 1891, pp. 293-314.

FRIEND, H. Identification of Templeton's British Earthworms. Nature, xlv, p. 273, woodcut.

GARSTANG, W. *Phoronis* at Plymouth. J. Mar. Biol. Ass. ii, p. 77.

GOTO, S. (1) On the connecting Canal between the oviduct and the intestine in some Monogenetic *Trematodes*. (Preliminary communication.) Zool. Anz. xiv, pp. 103 & 104.

— (2) On *Diplozoon nipponicum*, n. sp. J. Coll. Sci. Japan, iv, 1890, pp. 151-192, 2 pls.

Comes to the conclusion of Zeller, that the union of the two individuals is a permanent copulation, the vas deferens of the one individual opening into the yolk-duct of the other, and not into Laurer's canal.

GRAFF, L. VON. (1) *Enantia spinifera*, der Repräsentant einer neuen *Polycladen*-Familie. MT. Ver. Steierm. 1889, 16 pp., 1 pl.

— (2) Sur l'organisation des Turbellariés acoeles. Arch. Z. expér. ix, pp. 1-12.

Résumé without figures of monograph, No. 3.

[GRAFF, L. VON.] (3) Die Organisation der *Turbellaria acœla*. Leipzig : Engelmann, 1891, 4to. Mit einem Anhang. (See HABERLANDT.) 90 pp., 10 pls., 3 woodcuts.

For abstract by F. v. WAGNER, see Biol. Centralbl. xi, pp. 654-666.

GRIFFITHS, A. B. On the Blood of the *Invertebrata*. P. R. Soc. Edinb. xviii, pp. 288-294.

Blood of *Lumbricus*, p. 294.

GUERNE, J. DE, & RICHARD, J. Entomostracés, Rotifères, et Protozoaires provenant des récoltes de M. E. Belloc dans les Étangs de Cazau et de Hourtins (Gironde). Bull. Soc. Z. Fr. xvi, pp. 112-115.

*Rotifera* : *Anurœa cochlearis*, Gosse, and *Pterodina*, sp., from the étang de Cazau.

GUILLEBAU, A. (1) Ein Fall von *Echinococcus multilocularis* beim Rinde. MT. Ges. Bern. 1890, pp. 7-11, 3 figs. in text.

— (2) Ein neuer Fall von *Cysticercus* der *Tænia saginata* beim Rinde. T. c. pp. 12-15, 1 woodcut.

HAASE, E. Ueber die Entwicklung des Parasitismus im Tierreich. Schr. Ges. Königsb. 31st Jahrg. Sitzung am 2 Okt. 1890, pp. 29-33.

HABERLANDT, G. Ueber den Bau und die Bedeutung der Chlorophyllzellen von *Convoluta roscoffensis*. Anhang to Graff's monograph. Leipzig : 1891, pp. 75-90 [*vide supra*, GRAFF (3)].

HAMANN, O. (1) Zuz Kenntniss des Baues der *Nemathelminthen*. SB. Ak. Berlin, iv, 1891, pp. 1-5.

*Lecanocephalus* has only one longitudinal canal, which lies in the right lateral field, and which discharges outwards on the ventral side under the nerve-ring. It reaches backwards only as far as the middle of the body, where it becomes looped, and opens by a fine pore into the body-cavity.

— (2) Die kleineren Süsswasserfische als Haupt- und Zwischenwirthe des *Echinorhynchus proteus*, Westr. CB. Bakt. Parasit. x, pp. 791 & 792.

This is the only parasite known which employs as intermediate hosts two different types of animals, viz., *Gammarus pulex* and freshwater fish, especially *Phoxinus phoxinus*, in the liver. Those fish which have the larvæ of *Echinorhynchus* in their liver, have usually the adults in their intestine.

— (3) Neue Cysticercoiden mit Schwanzanhängen. Jen. Z. Nat. xxv, pp. 553-564, Taf. xxiv.

HASSALL, A. A new species of Trematode infesting Cattle (*Fasciola carnosa*). (Am. Vet. Rev. 1891, pp. 208 & 209, 1 fig.) CB. Bakt. Parasit. x, pp. 464 & 465.

Footnote says specific name has been altered to *americana*, as other name is already employed.

HASWELL, W. A. Jottings from the Biological Laboratory of Sydney University. 14. On a remarkable Flat-worm parasitic in the Golden Frog. P. Linn. Soc. N.S.W. (2) v, pp. 661-666, pl. xx.

It is a Cestode (unnamed) allied to *Ligula*, found in subdermal lymph-spaces of *Hyla aurea*.

HOLT, W. L. Additions to the Invertebrate Fauna of St. Andrew's Bay. Ann. N. H. (6) viii, pp. 182-184, pl. xi.

Includes *Vermes*.

\*HOOD, J. List of *Rotifera* found within a radius of twenty miles round Dundee. Scot. Nat. (3) i, pp. 20-25 & 71-80.

List contains 224 species.

HORST, R. (1) Descriptions of Earthworms. Notes Leyd. Mus. xiii, 1891, pp. 77-84, pl. vi.

*Anteus gigas*, Perrier, is not identical with *Microchaeta rappi*. With reference to circulation of blood in earthworms (pp. 83 & 84), author says he put forward the same view as Bourne's, as to the course of the blood, twelve years ago.

— (2) Parasites of *Orthogoriscus mola*. Tijdschr. Nederl. Dierk. Ver. (2nd ser.) iii, 1890, Verslag. pp. xv & xvi.

In Dutch.

— (3) Over de morphologie van het vrouwelijk geslachtsorgaan van *Eudrilus*. T. c. pp. xxxv & xxxvi.

— (4) On the function of the receptaculum seminis of some tropical *Lumbricidae*. T. c. p. lxxxv.

In Dutch.

— (5) Sur quelques Lombriciens exotiques appartenant au genre *Eudrilus*. Mém. Soc. Zool. iii, 1890, pp. 223-240, pl. viii.

Proposes name, *E. jullieni*, to include following species of Perrier:—*E. lacazei*, *E. peregrinus*, *E. decipiens*, and *E. boyeri*. Discusses morphology of the genital apparatus of the *Eudrilidae*.

— (6) Preliminary Note on a new genus of Earthworms. Zool. Anz. xiv, pp. 11 & 12.

*Glyphidrilus weberi*.

HOYER, H. Ueber ein für das Studium der "direkten" Kernteilung vorzüglich geeignetes Objekt. Anat. Anz. v, 1890, pp. 26-29, 1 fig.

Intestinal cells of *Rhabdonema nigrovamosum*.

HUDSON, C. T. The President's Address on some Doubtful Points in the Natural History of the *Rotifera*. J. R. Micr. Soc. 1891, pt. 1, pp. 6-18.

IMHOF, O. E. (1) Ueber die pelagische Fauna einiger Seen des Schwarzwaldes. Zool. Anz. xiv, pp. 32-38.

2 new species of *Rotifera*.



[IMHOF, O. E.] (2) Die Fauna des Bodensees. *T. c.* pp. 42 & 44.

— (3) Antwort bezüglich der Rotatorien; *Polyarthra* und *Schizocerca*. *T. c.* pp. 446 & 447.

— (4) Notiz bezüglich: Liste des Rotifères observés en Galicie par le Dr. A. Wierzejski. *T. c.* p. 125.

Identifies *Polyarthra platyptera*, var. *euryptera*, n. var. *Wierzejski*, with his *P. latiremis* and *Schizocerca diversicornis*, Daday, with his *Brachionus amphifurcatus*. See, however, DADAY and WIERZEJSKI.

JÄGERSKIÖLD, L. A. (1) Einiges über die Schmarotzer der nordatlantischen *Balanopteriden*. *Biol. Fören.* iii, 1891, pp. 127-134.

Tabular account of the parasites, most frequent being—*Echinorhynchus turbinella*, Dies., *Ogmogaster plicatus*, Creplin, and *Diplogonoporus balanopterae*, Lönnberg. *Diplobothrium affine*, Lönnberg, otherwise only known to occur in Selachians, was found in one whale.

— (2) Ueber den Bau des *Ogmogaster plicatus*, Creplin (*Monostomum plicatum*, Creplin). *Sv. Ak. Handl.* xxiv, No. 7, 32 pp., 2 pls.

JOURDAN, É. (1) L'innervation de la trompe des *Glycères*. *C.R.* cxii, 1891, pp. 882-884.

— (2) Les corpuscles sensitifs et les glandes cutanées des *Géphyriens* inermes. *Ann. Sci. Nat.* (7) xii, Nov. 1891, pp. 1-14, pl. i.

\*KAISER, J. Beiträge zur Kenntniss der Anatomie, Histologie, und Entwicklungsgeschichte der *Acanthocephalen*. *Bibl. Zool.*, Heft vii, Lief. 3, 1891.

Not yet completed.

KENNEL, J. v. (1) Die Ableitung der Vertebratenaugen von den Augen der *Anneliden*. *Dorpat*: 1891, 4to, 28 pp., 1 pl.

— (2) Ueber einige *Nemertinen*. *SB. Ges. Dorp.* ix, pp. 289-293.  
2 new species and 1 new genus.

KINGSLEY, J. S. (1) Some recent papers on Earthworms. *Am. Nat.* xxv, 1891, pp. 1-11.

Abstract and comparison of Wilson and Bergh's papers on development of *Lumbricus*, &c.

— (2) Record of American Zoology. *T. c.* pp. 252-259 & 984-989.  
*Vermes*, pp. 255, 256, 986, & 987.

\*KÖNIG, F. Der cystische Echinococcus der Bauchhöhle und seine Eigenthümlichkeiten vor, bei und nach der Operation. (Inaug. Diss. Göttingen, 8vo, 55 pp. Leipzig: 1890.) *CB. Bakt. Parasit.* ix, pp. 125 & 126.

KONINGSBERGER, —. Over het watervaatstelsel bij de *Polycladen*. *Tijdschr. Nederl. Dierk. Ver.* (2nd ser.) iii, 1890, Verslag, p. lxxxiii.

KRÆMER, A. Vorläufige Mittheilung über *Cyathocephalus truncatus*. *Zool. Anz.* xiv, pp. 451-453.

KÜHN, J. Neuere Versuche zur Bekämpfung der Rüben nematoden. CB. Bakt. Parasit. ix, pp. 563-566 & 593-597; also Biol. Centralbl. xi, pp. 343-351.

LANG, A. Ueber die äussere Morphologie von *Hæmentaria ghilianii*, F. de Filippi. Festschr. zur Feier des fünfzigjährigen Doctor-Jubiläums der Herren Prof. Dr. von Nägeli und von Köl liker. Zurich: 1891, pp. 199-211, 1 Taf., 3 figs. in text.

\*LANGENBUCH, C. Der Leberechinococcus und seine Chirurgie. Stuttgart: 1890, 8vo, 169 pp., 19 woodcuts. See CB. Bakt. Parasit. ix, pp. 545 & 546.

LEHNERT, G. H. Beobachtungen an Landplanarien. Arch. f. Nat., 57th Jahrg., pp. 306-350.

Biological observations on *Bipalium kewense* and *Geodesmus bilineatus*. Description of nature of food and method of feeding. *Bipalium* is fondest of earthworms, pp. 322-324. Regeneration and reproduction, pp. 328-330 & 342-347. Anatomy of *Bipalium kewense*, pp. 330-342.

LEICHTENSTERN, O. Ueber *Ankylostoma duodenale*. CB. Ver. Rheinl., 47th Jahrg., pp. 58-66.

LEIDY, J. (1) Notice of some *Entozoa*. P. Ac. Philad. 1891, pt. ii, pp. 234-236.

— (2) Parasites of *Mola rotunda*. *Op. cit.* 1890, p. 281.  
1 new species of *Distomum*.

LENHOSSÉK, V. (1) Die sensiblen Nerven des Regenwurms. (Vorläufige Mittheilung.) Verh. Ges. Basel. Okt. 1891.

— (2) Demonstrationen von Präparaten, welche nach Golgi's rascher Methode hergestellt sind. Verh. Anat. Ges., 5th Versamml. München: May 18-20th, 1891.

Sections through ventral cord of Earthworm.

LEUCKART, R. (1) Ueber *Tenia madagascariensis*, Dav. Verh. deutsch. zool. Ges., 1st Jahresversamml. Leipzig: 1891, pp. 68-71.

— (2) Ueber einen an *Aphodius fimetarius* sich verpuppenden freilebenden Rundwurm—*Rhabditis coarctata*, n. sp. T. c. pp. 54-56.

See MONIEZ (1).

LINSTOW, VON. (1) Ueber *Filaria tricuspis* und die Blutfilarien der Krähen. Arch. f. Nat. lvii, pp. 292-305, Taf. xi.

Under name of *F. attenuata*, two species have been hitherto understood, viz., *F. attenuata*, from body-cavity of predatory birds, and *F. tricuspis*, Fedt., from body-cavity of crows. From the latter arise the blood-filariae.

— (2) Ueber die Entwicklungsgeschichte von *Gordius tolosanus*, Duj. CB. Bakt. Parasit. ix, pp. 760-762.

[LINSTOW, VON.] (3) Weitere Beobachtungen an *Gordius tolosanus* und *Mermis*. Arch. mikr. Anat. xxxvii, pp. 239-249, Taf. xii.

— (4) Ueber den Bau und die Entwicklung von *Tænia longicollis*, Rud. Ein Beitrag zur Kenntniss der Fischtänien. Jen. Z. Nat. xxv, pp. 565-576, Taf. xxv.

The larvæ of *T. longicollis* occur encysted in the liver of the same fish (*Salmonidæ*) whose intestine harbours the adult, as is the case also with *Trienophorus nodulosus*.

LINTON, E. (1) Notes on *Entozoa* of Marine Fishes of New England, with Descriptions of several New Species. Part II. Rep. U. S. Fish. Comm. 1887. Washington: 1891, pp. 719-899, 15 pls.

25 new species, 7 new genera.

— (2) On Two Species of Larval *Dibothria* from the Yellowstone National Park. Bull. U. S. Fish Comm. 1889, ix, pp. 65-79, pls. xxiii-xxvii.

1 new species of *Ligula*.

— (3) A Contribution to the Life History of *Dibothrium cordiceps*, a parasite infesting the Trout of Yellowstone Lake. T. c. pp. 337-358, pls. cxvii-cxix.

*Dibothrium (Bothriocephalus) cordiceps*, Leidy, is known to occur in its larval stage only in the Rocky Mountain trout (*Salmo mykiss*), where it lives either free or encysted on or among the viscera, beneath the peritoneal lining of the abdominal cavity, or burrowing in the muscular tissue of the body-wall. Author believes to have established the fact that the final host of this parasite is the White Pelican (*Pelicanus erythrorhynchus*), whose food consists, apparently to a large extent, of the trout.

LOMINSKY, —. Ueber Symbiose des *Echinococcus* mit *Coccidien* (Wratsch 1890, No. 18, Russian). CB. Bakt. Parasit. ix, pp. 124 & 125.

LÖNNBERG, E. (1) Bemerkungen zum "Elenco degli Elminti studiati à Wimereux nella primavera del 1889" dal Dott. Fr. Sav. Monticelli. Biol. Fören. iii, pp. 4-9.

See MONTICELLI (1).

— (2) Mittheilungen über einige *Helminthen* aus dem Zool. Museum der Universität zu Christiania. T. c. pp. 64-78, 1 pl.

New species of *Didymozoon*.

\* — (3) *Helminthologische* Beobachtungen von der Westküste Norwegens. Erster Teil. *Cestoden*. Bih. Sv. Ak. Handl. xvi, 47 pp.

3 new species.

\* — (4) Anatomische Studien über Skandinavische *Cestoden*. Sv. Ak. Handl. xxiv, No. 6, 109 pp., 3 pls.

MAGGIORA, A. Ueber einen Fall von *Tænia inermis fenestrata*. CB. Bakt. Parasit. x, pp. 145-151. Also in Italian in Boll. Mus. Zool. Anat. Comp. Torino, vi, No. 104, 7 pp.

MALAQUIN, A. (1) Sur la Reproduction des *Autolyteæ*. Rev. Biol. iii, pp. 172-183.

— (2) Notes Morphologiques sur les *Annélides*. T. c. pp. 458-469.

I. Comparaison entre le développement et la morphologie des parapodes chez les *Syllidiens*. II. Homologie des appendices cephaliques et pédieux chez les *Annélides*. See also C.R. cxiii, pp. 45-48 & 155-158.

MALARD, A. E. (1) Sur les cœcums hépatiques des *Aphroditens*. C.R. Soc. Philom. 1891, No. 17, p. 2.

— (2) *Aphroditens* rapportés par l'expédition du Cap Horn. T. c. No. 16, pp. 1 & 2.

The *Aphrodita echidna* (Quatrefages), which McIntosh described in 'Challenger' Report, does not belong to that species. Author proposes name of *A. magellanica*, n. sp. *A. sericea* is merely a Mediterranean and Baltic variety of *A. aculeata*.

— (3) Sur les palpes labiaux de l'Aphrodite (Glandes salivaires de M. de Quatrefages). Bull. Soc. Philom. (8th ser.) iv, Nov. 1891, pp. 15 & 16.

MAN, J. G. DE. Quatrième note sur les Nématodes libres de la Mer du Nord et de la Manche. Mém. Soc. Zool. iii, année 1890, pp. 169-195, pl. iii-v.

3 new species and 1 new genus.

MASIUS, J. Contribution à l'étude des Rotateurs. Arch. Biol. x, pp. 651-682, pls. xxv & xxvi.

Anatomy of *Asplanchna helvetica* and *Lacinularia socialis*.

MATZ, F. Beiträge zur Kenntniss der *Bothriocephalen*. Arch. f. Nat. 58th Jahrg., Dec. 1891, pp. 97-122, Taf. viii.

Comparative account of external form and topographical relations of sexual glands of several species of *Bothriocephalus*.

MAUPAS, E. Sur le déterminisme de la sexualité chez l'*Hydatina senta*. C.R. cxiii, pp. 388-390.

MÉGNIN, P. (1) Sur l'embryogénie de l'*Echinorhynchus proteus*. C.R. Soc. Biol. iii, pp. 324 & 325.

— (2) Un nouveau *Ténia* du Pigeon, ou plutôt une espèce douteuse de Rudolphi, réhabilitée. T. c. pp. 751-753.

*Tenia sphenoccephala*, Rud., from *Columba livia* and *Turtur auritus*.

— (3) Sangsues d'Algérie et de Tunisie ayant séjourné plus d'un mois dans la bouche de boeufs et de chevaux. Bull. Soc. Z. Fr. xvi, p. 222.

MEYER, E. (1) Ueber die morphologische Bedeutung der borstentragenden "Fühlereirren" von *Tomopteris*. Biol. Centralbl. x, pp. 506 & 507.

— (2) Ueber die Nephridien und Geschlechtsorgane von *Lopadorhynchus*. T. c. pp. 507 & 508.

MICHAELSEN, W. (1) *Oligochaeten* des Naturhistorischen Museums in Hamburg. Part iv. JB. Hamb. viii, 42 pp., 1 pl.

12 new species and 2 new genera.

— (2) Beschreibung der von Herrn Dr. Fr. Stuhlmann auf Sansibar und dem gegenüberliegenden Festlande gesammelten Terricolen. Anhang I. Uebersicht über die *Teleudrilinen*. II. Die Terricolen-Fauna Afrikas. *Op. cit.* ix, 72 pp., 4 pls.

12 new species.

— (3) Terricolen der Berliner Zoologischen Sammlung. I. Afrika. Arch. f. Nat. 57th Jahrg. pp. 205–228, Taf. viii.

7 new species and 1 new genus.

— (4) Die Terricolen-Fauna der Azoren. Abh. Ges. Hamb. xi, Heft 2, 8 pp.

2 new species.

MILLSON, A. The Work of Earthworms on the African Coast. Kew Bull. Miscell. Information, 1890, pp. 243 & 244.

MONIEZ, R. (1) Les nymphes de *Rhabditis*. Rev. Biol. iii, pp. 470–473.

Leuckart watched the metamorphosis of *Rhabditis coarctata*, n. sp. [see LEUCKART (2)]. The free-swimming *Rhabditis* fixed themselves on the *Aphodius*, became immobile, and the contents of the body detached themselves from the cuticle and fused into a mass. A moult then ensues. Author says he himself described this process two years ago.

— (2) Sur l'*Allantonema rigida*, v. Siebold, parasite de différents Coléoptères coprophages. T. c. pp. 282–284; also C.R. cxii, pp. 60–62.

*A. rigida* found in body-cavity of *Aphodius*. Note additionnelle on *A. diplogaster*, v. Linst., p. 284.

— (3) Sur la bifurcation accidentelle que peut présenter la chaîne des *Cestodes* et sur les anneaux dits surnuméraires. Rev. Biol. iii, pp. 135–142, pl. iv.

— (4) Notes sur les *Helminthes*. *Op. cit.* iv, pp. 22–34, 65–79, & 108–118.

I. Sur des larves de *Trématodes* qui se fixent à la surface de la coquille d'*Ostracodes* d'eau douce et sur le corps des *Hydrachnides*.

Author is inclined to assign the larvæ which are encysted on the *Ostracods*, to the *Distoma perlatum*, Nordm., of the tench; while he is unable to identify those on the *Hydrachnids*. It is probable that the development of the forms represented by these larvæ is comparatively simple, without the intervention of *Cercaria*, &c.

II. Sur les Cysticerques des *Ostracodes* d'eau douce.

Cysticerus of *T. coronula* occurs in *Cypria ophthalmica* and *Candona candida* in north of France. Mrázek has found it in *Cypris ovum*, Jur. Cysticerus of *T. anatina* in *Cypris incongruens*, from Lille; and that of

*T. gracilis* was found in a *Cypria ophthalmica* from Chinese Lake of Sitaï.

III. *Distoma flagellatum*, n. sp. du *Gymnotus electricus*.

IV. Sur les *Ténias* du Daman (*Hyrax*).

1 new species.

V. Sur le *Moniezia ovilla*.

VI. Espèces nouvelles ou peu connues du Genre *Moniezia*, pp. 65-73.

2 new species.

VII. Tableau synoptique des Cestodes parasites du Mouton, pp. 74 & 75.

VIII. *Anoplocephala blanchardi*, n. sp., pp. 75 & 76.

IX. Sur un prétendu nouveau mode d'enkystement du *Distoma lanceolatum*, pp. 77-79.

The form described by Cosmovici (*vide supra*) is not at all new, and does not belong to *D. lanceolatum*, but has long been known as *D. duplicatum*, the adult of which has not yet been described.

X. Sur l'identité de quelques espèces de *Trématodes* du type du *Distoma clavatum* (*Hirudinella*).

*D. clavatum* and *D. ingens* are two distinct species—contrary to opinion of Blanchard.

[MONIEZ, R.] (5) Le *Gymnorhynchus reptans*, Rud., et sa migration. C.R. cxiii, pp. 870 & 871.

This Tetrarhynchid is very common in the *Orthogoriscus mola*. It was not known in the perfect state, but author has at last found it in the intestine of the shark, *Oxyrhina glauca*.

MONTICELLI, F. S. (1) Un Mot de Réponse à M. Lönnberg. Bull. Sci. Fr. Belg. xxiii, pp. 355-357.

See LÖNNBERG (1).

— (2) Della spermatogenesi nei Trematodi. Nota riassuntiva. Boll. Soc. Nat. Napoli, v, pp. 148-150.

— (3) Notizie su di alcuni specie di *Tenia*. T. c. pp. 151-174, tav. viii.

I. Di alcune *Tenia* delle collezioni del Museo Britannico. II. Dei tre *Tenia* dei Siluridi. 3 new species.

— (4) Di alcuni organi di Tatto nei *Tristomidi*. Contributo allo studio dei Trematodi monogenetici. Parte I. T. c. pp. 99-134, tav. v & vi.

Description of nerve-supply to the anterior marginal tentacles of certain *Tristomidæ*, and of their use to the animal during its movements of progression. Description of nervous system of *Epibdella*, p. 125, and of the anterior cutaneous unicellular glands of same genus, pp. 106 & 107. Appendix consisting of notes and observations on various species of

*Trematodes*, pp. 121, *et seq.* Synopsis of genus *Tristomum*, p. 123, and of *Epibdella*, p. 125. 2 new species of *Tristomum*.

[MONTICELLI, F. S.] (5) Osservazioni intorno ad alcune Forme del Gen. *Apoblemma*, Dujard. Atti Acc. Tor. xxvi, 1891, 30 pp., 1 pl.

Includes a new species of *Apoblemma*.

MONTICELLI, F. S., & CRETÉ, C. Ricerche intorno alla Sottofamiglia *Solenophorinæ*, Montic. Creté. Mem. Acc. Tor. (2) xli, 8vo, 24 pp., 1 pl.

Anatomical and systematic.

MORGAN, T. H. (1) The Anatomy and Transformation of *Tornaria*. A preliminary Note. Johns Hopk. Univ. Circ. x, pp. 94-96.

— (2) The Growth and Metamorphosis of *Tornaria*. J. Morph. v, pp. 407-450, pls. xxiv-xxviii.

Includes an account of the Nassau *Tornaria*, pp. 428-431.

MOROT, —. Quelques considérations sur la dégénérescence des cysticerques ladriques du porc. (Jour. de Méd. Vét. et de Zootechnie, Oct. 1890, pp. 529-532.) CB. Bakt. Parasit. ix, pp. 239 & 240.

MRÁZEK, M. Recherches sur le développement de quelques *Ténias* des oiseaux. Abh. Böhm. Ges. 1891, pp. 97-131, 2 pls.

French *résumé* of a work in Czech.

\*NEUMANN, G. Observations sur les *Ténias* du Mouton. C.R. Soc. Toulouse, 18th March, 1891.

PARONA, C. (1) Elmintologia Italiana : Bibliografia, Sistematica, Storia. Boll. scient. xiii, (continuation) No. 1, pp. 26-32, No. 2, pp. 58-64.

— (2) Sopra alcuni Elminti di Vertebrati Birmani, raccolti da Leonardo Fea. Ann. Mus. Genov. (2a) vii, 1890, pp. 765-780, Tav. iii.

1 new species of *Tenia* and 7 of *Nematoda*.

PARONA, C., & PERUGIA, A. (1) Intorno ad alcune *Polystomeæ* e considerazioni sulla sistematica di questa famiglia. Atti Soc. Ligust. i, fasc. 3, 1890, 20 pp., 1 pl.

New genus of *Trematoda*. See also CB. Bakt. Parasit. ix, p. 319.

— (2) Res Ligusticæ, xiv. Contribuzione per una Monografia del Genere *Microcotyle*. Ann. Mus. Genov. (2) x, pp. 173-219, Tav. iii-v.

Oviduct and vas deferens open into a common genital atrium, whose external aperture presents a chitinous armature, consisting of a bulb-like prominence surmounted by circles of uncini. These uncini are periodically thrown off, as the authors found by an examination of some 50 specimens of *M. sargi*. 1 new species is described. Genus *Azine* is distinct from *Microcotyle*.

— (3) Sulla *Vallisia striata*, Par. Per., Risposta al Dr. P. Sonsino. Zool. Anz. xiv, pp. 17-19.

*Vallisia striata*, Par. Per., = *Octocotyle arcuata*, Sonsino.

PASQUALE, A. Le Tenie dei Polli di Massaua. (Descrizione di una nuova specie.) Giorn. Internat. Sci. Med. xii, 1890, 5 pp., 1 pl.

\*PERRONCITO, E. (1) Caso di Anchilostomiasi e di concomitanza del *Megastoma intestinale* in grandissimo numero. Giorn. R. Acc. Med. Torino, Ann. 54, No. 6, p. 284.

\*——. (2) Gli Abissini e la *Tenia mediocanellata*. Op. cit. Nos. 3 & 4.

\*——. (3) Sopra un caso di *Tenia nana*, osservata per la prima volta in Piemonte. T. c. No. 6, pp. 285 & 286.

PERUGIA, A. [See PARONA & PERUGIA.]

PINTNER, T. (1) Nochmals über den Begattungsakt der parasitischen *Plathelminthen*. Als Erwiderung an Herrn Brandes. CB. Bakt. Parasit. ix, pp. 726–729.

——. (2) Ueber *Cercaria clausii*, Monticelli. Arb. z. Inst. Wien, ix, pp. 285–294, Taf. xxi.

PLESSIS, G. DU. Sur une nouvelle *Oerstedtia* aveugle mais portant une paire de vésicules auditives (otocystes). Zool. Anz. xiv, pp. 413–416.

*O. aurantiaca*, n. sp., also *O. claparèdii*, name proposed by author for a species described by Claparède, but unnamed.

PREYER, W. Ueber die Anabiose. Biol. Centralbl. xi, pp. 1–5.

Revivification of dried *Rotifera* and *Anguillulidæ*.

RAILLIET, A. (1) Développement expérimental du *Cysticercus tenuicollis* chez le chevreau. Bull. Soc. Z. Fr. xvi, pp. 157 & 158.

Author fed a young goat of six weeks' with a whole *Tenia marginata*, from small intestine of a dog, and after eight days goat died, and larvæ of the *Tenia* were found in its liver and lungs.

——. (2) Sur la durée de la vie des *Cénures*. T. c. pp. 159 & 160.

*Cœnurus serialis*, P. Gervais, which infests the conjunctiva of the *Leporidae*, has a larval existence of over two years.

——. (3) Les parasites des animaux domestiques au Japon. Le Nat. Ser. 2, xii, 1890, pp. 142 & 143. See also CB. Bakt. Parasit. ix, pp. 123 & 124.

1 new species of *Distomum*.

——. (4) Sur la *Strongylose bronchiale* du Cheval et sur le ver qui la détermine. C.R. Soc. Biol. (9), iii, pp. 105–108.

The worm is *Strongylus arnfieldi*, Cobbold.

RANDOLPH, H. The Regeneration of the Tail in *Lumbriculus*. Zool. Anz. xiv, pp. 154–156.

RETZIUS, G. (1) Biologische Untersuchungen. Neue Folge II. Stockholm: 1891, 4to. I. Zur Kenntniss des centralen Nervensystems der Würmer, pp. 1–28, Taf. i–x.

*Polychæta* and *Hirudinea*.



[RETZIUS, G.] (2) Ueber Nervenendigungen an den Parapodienborsten und über die Muskelzellen der Gefäßwände bei den *Polychäten Annulaten*. Biol. Fören. iii, pp. 85-89.

RICHARD, J. [See GUERNE & RICHARD.]

RITZEMA-BOS, J. Zwei neue Nematoden-krankheiten der Erdbeerpflanze. Vorläufige Mittheilung. (Zeitschr. f. Pflanzenkrankheiten i. 1891, pp. 1-16, 1 pl.) CB. Bakt. Parasit. x, pp. 528 & 529; also Biol. Centralbl. xi, pp. 737-739.

One of these diseases is caused by *Aphelenchus fragariæ*, n. sp., and is called "Blumenkohlkrankheit der Erdbeeren." The other is caused by *A. ormerodis*, n. sp.

ROHDE, E. Histologische Untersuchungen über das Nervensystem der *Hirudineen*. Zool. Beitr. iii, pp. 1-68, Taf. i-vii; also SB. Ak. Berlin, 1891, pp. 21-32.

ROSSETER, T. B. Sur un Cysticercoïde des *Ostracodes*, capable de se développer dans l'intestin du Canard. Bull. Soc. Z. Fr. xvi, pp. 224-229.

Cysticeroid of *Tænia lanceolata*, Goeze, from *Cypris cinerea* from Canterbury. See, however, BLANCHARD (4), who says the *Tænia* in question is *Echinocotyle rosseteri*, n. g. & sp.

ROULE, L. Considérations sur l'embranchement des Trochozoaires. Ann. Sci. Nat., 7th sér., xi, pp. 121-178.

"Trochozoa" is a name proposed by author for a new phylum, including the *Annelids* and *Molluscs*, and excluding the *Platyhelminths* and *Nemat-helminths*. The last two groups become independent in the author's system, and are each equivalent to the group *Trochozoa*.

ROUSSELET, C. (1) Note on *Dinops longipes*. J. Quek. Club, Ser. 2, iv, p. 263.

(*D. longipes*) = *Asplanchna eupoda*, Gosse, 1886.

— (2) On the Vibratile Tags of *Asplanchna amphora*. T. c. pp. 241 & 242, pl. xiii.

SABRAZÈS. [See BITOT & SABRAZÈS.]

SAINT-REMY, G. (1) Sur les organes génitaux des *Tristomiens*. CR. cxii, pp. 1072-1074.

— (2) Sur le système nerveux des *Monocotylides*. Op. cit. cxiii, pp. 225-227.

See translation in Ann. N. H. viii, 6th ser., pp. 480 & 481.

— (3) Synopsis des *Trématodes* Monogénèses. Rev. Biol. iii, pp. 405-416 & 449-457, pl. x. Continued in iv, pp. 1-21 & 90-107.

Valuable systematic compilation.

— (4) Recherches sur la structure de l'Appareil génital dans le genre *Microbothrium*, Olsson. Communication préliminaire. Rev. Biol. iii, pp. 213-223, 1 fig. in text.

1891. [VOL. XXVIII.]

SCHIMKEWITSCH, W. Versuch einer Klassifikation des Tierreichs. Biol. Centralbl. xi, pp. 291-295.

SCHULZE, F. E. Ueber *Trichoplax adherens*. Abh. Ak. Berl. 1891, 23 pp., 1 pl.

°SETTI, E. Sulle uova dei *Trematodi*. Atti Soc. Ligust. ii, 1891, 7 pp.  
For abstract, see BRAUN, (4) p. 421.

SHARP, B. On a probable new species of *Bipalium*. P. Ac. Philad. 1891, p. 120.

*B. manubriatum*, n. sp.

SHIPLEY, A. E. (1) On the Occurrence of *Bipalium kewense*, Moseley, in a new locality; with a Note upon the Urticating Organs. P. Cambr. Phil. Soc. vii, pp. 142-147.

— (2) On a new Species of *Phymosoma*, with a Synopsis of the Genus and some account of its Geographical Distribution. Q. J. Micr. Sci. xxxii, pp. 111-126, pl. xi.

*P. weldonii*. Preliminary note recorded last year.

SLUITER, C. P. Die Evertibraten aus der Sammlung des königlichen naturwissenschaftlichen Vereins in Niederländisch-Indien in Batavia. Zugleich eine Skizze der Fauna des Java-Meeres, mit Beschreibung der neuen Arten. 3. *Gephyreen*. Nat. Tijdschr. Nederl. Ind. Bd. 50, 1890, pp. 102-125, 2 pls.

4 new species.

SONSINO, P. (1) Importanza della Zooparasitologia Medica e specialmente degli Zooparassiti come Fattori di Malattie. Prelezione ad un corso di Parassitologia all' Università di Pisa. Lo Spallanzaui, Roma, 1891, xx (2), pp. 54-70.

— (2) Notizie di *Trematodi* della collezione del museo di Pisa. P.-v. Soc. Tosc. vii, 1890, pp. 137-143 & 173-178.

The second part (pp. 173-178) includes *Nematoda*.

— (3) Un nuovo *Distoma* del sotto-genere *Polyorchis*, Stoss. T. c. séance 6th July, 1890, 3 pp.

— (4) Un nuovo *Heterakis* del *Gallus domesticus*. T. c. and same séance, 2 pp.

— (5) Di un nuovo trematode raccolto dal *Pagrus orphus*. Op. cit. 16th Nov., 1890, 2 pp.; also Arch. Ital. Biol. xv, pp. 147 & 148.

*Anoplodiscus richiardii*, n. g. & sp.

— (6) Parassiti animali del *Mugil cephalus* e di altri pesci della collezione del Museo di Pisa. P.-v. Soc. Tosc. vii, séance 10th May, 1891, pp. 253-264.

— (7) Di un nuovo *Microcotyle* (*M. pancerii*) raccolto dall' *Umbrina cirrhosa*. T. c. pp. 303 & 304.

\*[SONSINO, P.] (8) Tre casi di *Tania nana* nei dintorni di Pisa. Riv. gen. ital. Clinica Med. iii, Nos. 8 & 9, Pisa, 1891.

— (9) Sull' *Octocotyle (Vallisia) striata*, Par e Per. Replica ai Profr. Parona e Perugia. Zool. Anz. xiv, pp. 87 & 88.

SOULIER, A. Études sur quelques points de l'anatomie des *Annélides Tubicoles* de la Région de Cette (Organes sécréteurs du tube et appareil digestif). Trav. Inst. Zool. Montpellier et Cette, No. ii, 310 pp., 10 pls.

SPENCER, W. B. Notes on some Victorian Land *Planarians*. P. R. Soc. Vict. 1891, pp. 84–93, pls. xi & xii.

2 new species of *Geoplana*.

SPENGEL, J. W. Über die Gattungen der *Enteropneusten*. Verh. deutsch. Zool. Ges., 1st Jahresversamml. Leipzig: 1891, pp. 47 & 48.

*Enteropneusta* consist of 19 species, divided among following genera: *Balanoglossus*, Delle Chiaje, *Ptychodera*, Eschscholtz, *Glandiceps*, n. g., and *Schizocardium*, n. g.

STILES, C. W. (1) Note sur les Parasites. 1. Sur la dent des embryons d'*Ascaris*. Bull. Soc. Z. Fr. xvi, pp. 162 & 163.

The so-called perforating tooth of the embryos of *Ascaris*, which led to belief that they passed through an intermediate host instead of developing directly, consists really of the three lips which are characteristic of the adult, and which in the embryo are approximated together, giving rise to the appearance of a tooth.

— (2) Note préliminaire sur quelques parasites. *T. c.* pp. 163–165.

— (3) Notes sur les parasites. III. Sur l'hôte intermédiaire de *P. Echinorhynchus gigas* en Amérique. *T. c.* pp. 240–242.

The host is the larva of *Lachnosterna arcuata*, and probably other species of *Lachnosterna*.

\*STOSSICH, H. (1) Elminti veneti raccolti dal Dr. Al. Conte de Ninni. 2nd series. Boll. Soc. Adr. xiii, 1891, 8 pp., 1 pl.

\*— (2) Il genere *Dipharagus*, Duj., lavoro monografico. *T. c.* 28 pp., 3 pls.

\*— (3) Elminti della Croazia. Soc. hist. nat. Croatica, v, Agram, 1890, pp. 129–136, tav. ii.

See BRAUN (4).

STUHLMANN, F. Beiträge zur Fauna centralafrikanischer Seen. I. Südcreek des Victoria-Niansa. Zool. Jahrb. Abth. f. Syst. v, pp. 924–926.

*Rotifera*: new species of *Noteus* (unnamed). *Oligochata*, *Dero*, *Acanthodrilus*.

STRASSEN, O. ZUR. Ueber *Filaria rigida*. (Vorläufige Mittheilung.) Zool. Anz. xiv, pp. 437–439.

\*SZCZYPORSKI, S. B. F. Des entozoaires de l'encéphale. Paris (Steinheil): 1891, 4to, 106 pp.

\*THOMPSON, P. G. *Dasydytes bisetosum*. Sci. Goss. 1891, pp. 160-162, 2 figs.

New species of *Gastrotricha*.

THORPE, V. G. New and Foreign *Rotifera*. J. R. Micr. Soc. 1891, pp. 301-306, pls. vi & vii.

7 new species. Male of *Trochosphaera equatorialis* from Brisbane.

TREADWELL, A. L. Preliminary Note on the Anatomy and Histology of *Serpula dianthus* (Verrill). Zool. Anz. xiv, pp. 276-280, 2 woodcuts.

VAILLANT, L. Nouvelles études sur les zones littorales. Ann. Sci. Nat. (7) xii, pp. 39-50.

Biology of *Leucodore ciliatus*, Johnston. Important biological paper.

VALLENTIN, R. Notes concerning the Anatomy of certain *Rotifers*. Ann. N. H. (6) viii, pp. 34-47, pls. iv & v.

VEJDOVSKY, F. (1) Entwicklungsgeschichtliche Untersuchungen. Heft I. Reifung, Befruchtung und die ersten Furchungsvorgänge des *Rhynchelmis*-Eies. Prag (J. Otto): 1888, pp. 1-166, Taf. i-x, & 7 woodcuts. Heft II. Die Entwicklungsgeschichte von *Rhynchelmis* und der *Lumbriciden*. Prag: 1890, pp. 167-298, Taf. xi-xx, & 2 woodcuts.

This is now recorded for the first time. A third Heft is announced.

— (2) Bemerkungen zur Mitteilung H. Fol's "Contribution à l'histoire de la fécondation." Anat. Anz. vi, pp. 370-375.

Claim of priority as to discovery of origin of Centrosoma or Periplast.

— (3) Note sur un *Tubifex* d'Algérie. Mém. Soc. Zool. iv, pp. 596-603, pl. xv.

Detailed description of spermatophores of *Tubifex blanchardi*, n. sp.

VIERORDT, H. Der multilokuläre Echinococcus der Leber (Berliner Klinik, Heft. 28, 1890, 16 pp.). CB. Bakt. Parasit. ix, pp. 20 & 21.

VILLOT, A. L'Evolution des *Gordiens*. Ann. Sci. Nat. (7) xi, pp. 329-401, pls. xiv-xvi.

VOELTZKOW, A. Vorläufiger Bericht über die Ergebnisse einer Untersuchung der Süßwasserfauna Madagascars. Zool. Anz. xiv, pp. 214-217 & 221-230.

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VOIGT, W. (1) Ueber *Heterodera radiculicola*, Greeff, and *H. schachtii*, Schmidt. SB. niederrhein. Ges. 47 Jahrg. 1890.

1st part. Infectionsversuche zur Unterscheidung von *Heterodera radiculicola* und *H. schachtii*, pp. 66-74.

2nd part. Über den Eiersack von *Heterodera schachtii* and *H. radicola*, pp. 93-98.

For review of this work, see CB. Bakt. Parasit. ix, pp. 21 & 22.

[VOIGT, W.] (2) *Planaria alpina* bei Bonn. SB. niederrhein. Ges. 48th Jahrg. 1891, pp. 37 & 38.

— (3) Ueber *Cœnurus serialis*, Gervais. T. c. p. 85.

WAGNER, F. v. Zur Kenntniss des Baues der sog. Haftpapillen von *Microstoma lineare*, Oerst. Zool. Anz. xiv, pp. 327-331, 1 woodcut.

The so-called "Haftpapillen" of *M. lineare* are merely the projecting free ends of the ducts of unicellular glands, so that they are by no means true papillæ.

WALCOTT, C. D. The Fauna of the Lower Cambrian or Olenellus Zone. U. S. Geol. Survey, 10th Annual Report, 1888-89, pt. 1, Geology. 1890.

*Annelida*, pp. 588 & 602-604.

WARD, H. B. On some points in the Anatomy and Histology of *Sipunculus nudus*, L. Bull. Mus. C. Z. xxi, pp. 143-182, pls. i-iii.

WATSON, A. T. The protective device of an Annelid. Nature, xlv, pp. 507 & 508, 3 figs.

A *Sabellid*.

WESTERN, G. (1) Notes on *Rotifers*. J. Quek. Club, iv, pp. 320-322, pl. xxi.

1 new species.

— (2) Notes on *Rotifers*: a free-swimming variety of *Lacinularia*, and a new *Rotifer* found at Guildford. T. c. pp. 254-258, pl. xvii.

*Dinops longipes*, n. g. & sp.

WHITMAN, C. O. (1) Spermatophores as a means of Hypodermic Impregnation. J. Morph. iv, pp. 361-406, pl. xiv.

— (2) Description of *Clepsine plana*. T. c. pp. 407-418.

WIERZEWSKI, A. (1) Liste des Rotifères observés en Galicie (Autriche-Hongrie). Bull. Soc. Z. Fr. xvi, pp. 49-52.

3 new varieties and 1 new species.

— (2) Erwiderung an Dr. Imhof bezüglich seiner Notiz zu meiner: Liste des Rotifères observés en Galicie in No. 361 Z. A. 1891. Zool. Anz. xiv, pp. 217 & 218.

Imhof's diagnoses deficient.

WISTINGHAUSEN, C. v. Untersuchungen über die Entwicklung von *Nereis dumerilii*. Ein Beitrag zur Entwicklungsgeschichte der *Polychæten*. Erster Theil. MT. z. Stat. Neap. x, pp. 41-74, Taf. vi & vii.

Formation of the germinal layers.

- WOODWORTH, W. M. Contributions to the Morphology of the *Turbellaria*. 1. On the Structure of *Phagocata gracilis*, Leidy. Bull. Mus. C. Z. xxi, pp. 1-46, 4 pls.
- ZELINKA, C. Studien über Räderthiere. III. Zur Entwicklungsgeschichte der Räderthiere nebst Bemerkungen über ihre Anatomie und Biologie. Z. wiss. Zool. liii, pp. 1-159, Taf. i-vi, 6 woodcuts. Anatomical, pp. 2-33. Biological, pp. 33-48. Embryological, pp. 48-132. Theoretical, pp. 132-153.
- ZSCHOKKE, F. (1) Weiterer Beitrag zur Kenntniss der Fauna von Gebirgsseen. Zool. Anz. xiv, pp. 119-123 & 126-129.
- . (2) Die Thierwelt der Hochgebirgsseen. Verh. deutsch. Zool. Ges. 1st Jahresversamml. Leipzig: 1891, pp. 48 & 49.
- Notes on *Planaria alpina*, &c.
- . (3) Die zweite zoologische Excursion an die Seen des Rhätikon. 23 Juli bis 15 Aug. 1890. Verh. Ges. Basel, ix, pp. 425-508.
- . (4) Die Parasitenfauna von *Trutta salar*. CB. Bakt. Parasit. x, pp. 694-699, 738-745, 792-801, & 829-838.

## II.—FAUNISTIC.

BRAUN (5). FRENZEL (3). HOLT. IMHOF (1, 2). STUHLMANN. VOELTZKOW, *Gastrotricha*, p. 216; *Hirudinea*, pp. 223, 224, & 227; *Nematoda*, *Oligochaeta*, pp. 224 & 227; *Turbellaria*, p. 225. WALCOT. ZSCHOKKE (1, 2, 3).

ZSCHOKKE (4) lays down the principle that the character of the parasites of an animal reflects the habits of the animal itself. From a consideration of its parasites, author confirms the statement of former observers that the Rhine Salmon (*Trutta salar*) does not feed during its sojourn in the river; but that when it mounts the river to spawn, it fasts. Out of 129 examples from the river, none contained parasites in the intestine proper, *i.e.*, below the appendices pyloricæ. The parasites decrease in number as the fish gets higher up the river. Those worms which inhabit closed-off portions of the body of the fish are unaffected by the fresh water, *e.g.*, *Ascaris capsularis*. The best idea of the effect of the fresh water on the parasites is to be derived from a consideration of *Bothriocephalus infundibuliformis*, which is a typical parasite of all the *Salmonidæ*. It is present in greatest numbers in the Rhine-salmon from May-July, when the greatest in-wandering from the sea occurs, and the minimum is reached in November and December, *i.e.*, the spawning season. In spite of its long stay in the river, the Rhine-salmon does not become infected with a single freshwater parasite. All other migrating fishes take up greater or less numbers of freshwater parasites. This is especially the case with *Trutta trutta*, which obtains its guests almost exclusively in fresh water, although it lives for a long time in the sea.

The *Trutta salar* of the Baltic (Ostseelachs) has no special periods of feeding and fasting, but eats as much in the rivers into which it wanders as it does in the sea, and thus acquires freshwater parasites, which, in so far as they occur in closed-off organs, continue to live on the return of the fish to the sea. Finally, the *Trutta salar* of the Tay possesses freshwater parasites below the pyloric appendages (e.g., *Echinorhynchus proteus* and *Distomum tereticolle*, &c.), thus confirming the conclusion to which McIntosh had for other reasons arrived, that the *Trutta salar* of the Tay takes up food from time to time. The general result to be drawn from above facts is that *Trutta salar* has different habits of life in the different rivers into which it wanders.

### III.—THE GENERAL SUBJECT,

ARRANGED SYSTEMATICALLY ACCORDING TO ORDERS.

#### GENERAL AND THEORETICAL PAPERS.

BRAUN (4). DAVISON. FRENZEL (4). HAASE. KENNEL (1). KINGSLEY (2). MILLSON. PARONA (1). PREYER. ROULE. SCHIMKEWITSCH. SONSINO (1).

### POLYCHÆTA.

#### NEW GENUS, AND NEW SPECIES AND VARIETIES.

- Ammochares ædificator*, Beaufort, N. C., ANDREWS, (4) p. 296, n. sp.  
*Aphrodita magellanica*, Magellan Straits, MALARD (2), n. sp.  
*Axiiothea mucosa*, Beaufort, N. C., ANDREWS, (4) p. 294, n. sp.  
*Branchiomma vesiculosum* (Mont.), var. i, *fuscum*, n. var., var. ii, *violaceum*, n. var., Cette, SOULIER, pp. 38 & 39.  
 ✓ *Callizonella*, n. g., for *Alciopa lepidota*, Krohn; APSTEIN (2).  
*Diopatra magna*, Beaufort, N. C., ANDREWS (3), p. 121, (4), p. 286, n. sp.  
*Eunice ornata*, Beaufort, N. C., *id.*, (4) p. 284, n. sp.  
*Harmothoë aculeata*, Beaufort, N. C., *id.* (4) p. 278, n. sp.  
*Loimia turgida*, Beaufort, N. C., *id.*, (4) p. 298, n. sp.  
*Ophelina agilis*, Beaufort, N. C., *id.*, (4) p. 289, n. sp.  
*Petaloproctus socialis*, Beaufort, N. C., *id.* (4), p. 295, n. sp.  
*Polydora commensalis*, Beaufort, N. C., *id.* (6, 4), n. sp.  
*Sabella pacifica*, California, FEWKES, pp. 34–38, n. sp.  
*Sabellaria californica*, California, *id.* pp. 34–38, n. sp.  
*Spio californica*, California, *id.* pp. 34–38, n. sp.  
*Vanadis fasciata*, N. Pacific, APSTEIN (1); *V. longicauda*, Atlantic (?)  
*latocirrata*, Chili, *V.* (or *Callizona*) *fusca*, Atlantic. *id.* (2): n. spp.

#### NEW DESCRIPTIONS, ANATOMY AND SYNONYMS.

- Annelida tubicola*, Anatomy; SOULIER.  
*(Aphrodita sericea)*, = *A. aculeata*; MALARD (2).

*Callizonella lepidota*, = (*Alciopa lepidota*) (Krohn); APSTEIN (2).

*Chloræmidæ*, Anatomy; BLES.

*Greeffia celox*, McIntosh; APSTEIN (2).

*Serpula dianthus*, Verrill; TREADWELL.

### DISTRIBUTION, BIOLOGY, PHYSIOLOGY.

ANDREWS (5, 6). CHIGI. MALARD (1, 3).

SOULIER agrees with Cosmovici, Meyer, and Brunotte (see also CHIGI), as opposed to Claparède, that the pericesophageal glands of the *Serpulaceæ*, which open to exterior by a common pore on dorsal side between branchial lobes, are nephridia, and have nothing to do with formation of tube. Latter is probably formed by secretion of the glands of the epidermis generally, and those of the collar and ventral shields (boucliers) particularly. *Myxicola* and rarely *Branchiomma* leave their tubes spontaneously and secrete new ones. The *Serpulidæ*, *Spirographis*, and *Sabella* are unable to form a new tube, and if they leave their old one it is to die.

VAILLANT provides an important biological paper on *Leucodore ciliatus*.

WISTINGHAUSEN (Biology, pp. 44 & 45). WATSON.

### HISTOLOGY.

ANDREWS (1, 2). BIEDERMANN (Nervous system of *Nereis pelagica*, pp. 450-453).

RETZIUS (1) (Nervous system of *Nephthys*, *Nereis*, *Lepidonotus*, *Sedentaria*, and *Aphroditidæ*, pp. 4-13, Taf. i-v). RETZIUS (2).

SOULIER (Alimentary canal, pp. 89-117; epidermis of *Sabellidæ*, pp. 180-240).

TREADWELL (*Serpula dianthus*, Verrill).

### MORPHOLOGY.

JOURDAN (1). MALAQUIN (2).

MEYER (1) concludes that the pair of long tentacles, which is characteristic of *Tomopteris*, and usually reckoned to the head, is really a pair of parapodia of the trunk, shifted forwards beyond the mouth. In young individuals these tentacles lie behind the mouth, and in course of growth advance forwards. They are not innervated from the brain, as hitherto supposed, but from the 2nd pair of ventral ganglia. *Tomopteris* therefore no longer presents an instance of parapodia occurring on the prostomium.

### REPRODUCTION, EMBRYOLOGY, GEMMATION.

ANDREWS (3). MALAQUIN (1, 2, see below).

MEYER (2) corrects Kleinenberg's statement that the testis and ovary of *Lopadorhynchus* arise at an advanced stage of development by invagination from ectoderm. As a matter of fact they arise as proliferations



from the peritoneal covering of the nephridia. Kleinenberg missed the nephridia altogether, and mistook their external pores for the openings of invaginations to form the testis and ovary.

MALACQUIN (1) distinguishes between asexual multiplication by simple fission and by budding. By the first method, several segments of the stock-individual are involved in the formation of new individuals, while by the second, only the anal segment is so involved, the remainder of the new individual budding out from the præanal segment of the stock. In some species of *Autolytus* the first method occurs, in others both occur, thus giving rise to multiple stolons, while in *Myrianida* only the second method—budding—occurs.

WISTINGHAUSEN describes the segmentation and formation of the germinal layers in *Nereis dumerilii*. He has also come to certain conclusions as to the relations between the *Nereis* and *Heteronereis* forms, which differ somewhat from those of Claparède. The young *N. dumerilii* either becomes sexually mature as *Nereis*, when it has reached a length of 15–30 m.m., or it changes itself into the small *Heteronereis*, which then becomes mature. The eggs of the ripe *N. dumerilii* contain a quantity of yolk, are laid in tubes and develop directly. The small *Heteronereis* occurs pelagically in large numbers in the spring, and the eggs are laid in gelatinous masses at the surface of the water. They contain only a small amount of yolk, and develop indirectly, i.e., with metamorphosis (Trochophore). For certain unknown reasons some *Nereis* forms, after having reached the above-mentioned length, at which many of them become mature, do not develop sexual organs, but grow still longer up to about 65 m.m., and eventually become metamorphosed into the large *Heteronereis*, which then becomes mature. The eggs of the latter contain some yolk, and are laid in tubes. Their development is unknown. The large *Heteronereis* never occurs pelagically.

## OLIGOCHÆTA.

### NEW GENERA, SPECIES AND VARIETIES (including their ANATOMY).

*Allolobophora leoni*, *jassyensis*, p. 15, *antipæ*, p. 16, Roumania, *lissænsis*, p. 18, Mediterranean Region, MICHAELSEN (1); *A. madeirensis*, Madeira, *id.* (3) p. 206; *A. japonica*, Japan, *id.* (4), preliminary diagnosis in footnote: n. spp.

*Benhamia bolavi*, Hamburg, *id.* (1), pp. 9–14; *B. tenuis*, West Africa, *id.* (1), p. 21; *B. intermedia*, Togo Land, *id.* (3) : n. spp.

*Dichogaster hupferi*, West Africa, *id.* (2) p. 66; *D. mimus*, Accra, *id.* (3), p. 212 : n. spp.

*Eminia*, n. g., for *E. equatorialis*, n. sp., Equat. Africa; BENHAM (2).

*Eudriloides titanotus*, Zanzibar, MICHAELSEN, (2) p. 10, n. sp.

*Eudrilus jullieni*, HORST (5); *E. pallidus*, Accra, MICHAELSEN, (3) pp. 216–219 : n. spp.

† *Fletcherodrilus*, n. g., *F. unicus*, var. *pelewensis*, n. var., Peléw Is. ; MICHAELSEN, (1) pp. 29-33.

† *Glyphidrilus*, n. g., for *G. weberi*, n. sp., Malay Arch. ; HORST (6).

† *Heliodrillus*, n. g., for *H. lagosensis*, n. sp., Lagos ; BEDDARD (8).

† *Hyperiodrilus*, n. g., for *H. africanus*, n. sp., Lagos ; *id.* (8).

† *Kynotus*, n. g., for *K. madagascariensis*, n. sp., Madagascar, MICHAELSEN, (3) pp. 207-212 ; *K. longus*, n. sp., Madagascar, *id.* (2) pp. 63-66.

† *Libyodrillus*, n. g., for *L. violaceus*, n. sp., Lagos ; BEDDARD (2, 4).

† *Megachæta tenuis*, pp. 17-19, *alba*, p. 19, East Africa, MICHAELSEN, (2), n. spp.

*Metadrillus rukajurdi*, East Africa, *id.* (2) pp. 28-32, n. sp.

*Notykus emini*, East Africa, *id.* (2) pp. 33 & 34, n. sp.

*Ocnodrilus eiseni*, British Guiana, BEDDARD (5), n. sp.

† *Paradrillus*, n. g., for *P. rosa*, n. sp., West Africa ; MICHAELSEN, (1) pp. 26-29.

*P. ruber*, Togo Land, p. 220, *purpureus*, West Africa, p. 222, *id.* (3) : n. spp.

† *Pelodrillus*, n. g., for *P. violaceus*, n. sp., New Zealand ; BEDDARD (6, 7).

*Perichæta sangirensis*, p. 36, *ferdinandi*, p. 38, *stelleri*, p. 39, Sangir, MICHAELSEN (1) ; *P. madagascariensis*, Madagascar, *id.* (3) ; *P. heterochæta*, Azores, *id.* (4) ; *P. malamaniensis*, Philippines, BENHAM, (1) p. 316 : n. spp.

*Perionyx gruenevaldi*, MICHAELSEN, (1) p. 33 ; *P. sansibaricus*, Zanzibar, *id.* (2) p. 4 : n. spp.

† *Phreodrilus*, n. g., for *P. subterraneus*, n. sp., New Zealand, BEDDARD (6, 7).

*Platydrillus lewaënsis*, pp. 11-14, *megachæta*, p. 14, *P. (?) callichætus*, p. 15, East Africa, MICHAELSEN (2), n. spp.

*Polytoreutus cæruleus*, var. i, *makakallensis*, n. var. ii, *korogweënsis*, n. var. iii, *affinis*, n. var. iv, *mhondaënsis*, n. var., pp. 34-41, East Africa ; *id.* (2).

*Pontodrilus bermudensis*, Bermuda, BEDDARD (7), n. sp.

† *Preussia*, n. g., for *P. siphonochæta*, n. sp., West Africa, MICHAELSEN, (1) p. 23 ; *P. (?) lundaënsis*, Lunda, *id.* (3) p. 219, n. sp.

*Pristina equisetæ*, p. 352, *brevisetæ*, p. 353, Madras, BOURNE (2), n. spp.

*Pterostylarides macrochæta*, *id.* (2) p. 349, n. sp.

*Reithodrilus minutus*, Makakalla, MICHAELSEN, (2) p. 21, n. sp.

*Siphonogaster millsoni*, Lagos, BEDDARD (1), n. sp.

† *Stylodrilus vej dovskyi*, Thames and Cherwell, BENHAM, (4) p. 209, n. sp.

*Tubifex blanchardi*, Algiers, VEJDovsky (3), n. sp.

#### NEW DESCRIPTIONS, SYNONYMS.

*Acanthodrilus kerguelarum*, Grube, = (*Lumbricus kerguelarum*), MICHAELSEN, (3) p. 226.

*Allolobophora hermanni*, Mich., pp. 5-7, *id.* (1).

*Allurus tetraëdrus*, Sav., pp. 7-9, *id.* (1).

*Anteus gigas*, Perrier, not identical with *Microchæta rappi*, pp. 77-82 ; HORST (1).

*Eudrilus jullieni*, Horst, = (*E. lacazei*, *peregrinus*, *decipiens*, and *boyeri*, Perrier) ; *id.* (5).

*Eudriloides gypsatus*, Mich. ; MICHAELSEN, (2) pp. 7-10.

*Fletcherodrilus unicus* = (*Cryptodrilus unicus*, Fletch., *C. purpureus*, Mich., and *C. fasciatus*, Fletch.) ; *id.* (1) pp. 31 & 32.

*Heterochæta costata*, Clap., 1863 ; BENHAM, (4) pp. 188-206.

*Lumbricus rubescens* = (*Omilurus rubescens*), Temp. ; FRIEND.

*Megascolex cæruleus*, Templeton, = (*Pleurochæta moseleyi*, Beddard) ; BOURNE (1).

*Microcolex dubius*, Fletch., Minorca ; MICHAELSEN, (1) pp. 19 & 20.

*Moniligaster barwelli*, BEDDARD (9).

*Paranais littoralis*, O. F. Müller ; BOURNE, (2) pp. 349-352.

*Spirosperma ferox*, Eisen ; BENHAM (4).

*Stuhlmannia variabilis*, Mich. ; MICHAELSEN, (2) pp. 23-28.

#### HISTOLOGY, PHYSIOLOGY.

BENHAM (1). CUÉNOT, pp. 447-458. GRIFFITHS, p. 294. LENHOSSÉK (1, 2).

#### DISTRIBUTION, BIOLOGY, TERATOLOGY.

BARROIS. BEDDARD (10, 11). BENHAM (3, 4). COLLIN (3).

#### MORPHOLOGY.

BEDDARD (3, 4) finds that in *Libyodrilus violaceus* the nephridial system consists of paired nephridia, which do not open immediately to the exterior, but are connected with an extensively ramifying system of tubes imbedded in the circular and longitudinal muscles. They consist of four principal longitudinal trunks, continuous from segment to segment, and of a singular large circular vessel in each segment, passing right round the worm at the junction of the circular and longitudinal muscles ; these are connected by a plexus of vessels, and numerous tubules leading to the exterior are given off from each circular trunk. In some of the genital segments the paired nephridia have almost disappeared, leaving only the integumental network. In the young worm just escaped from the cocoon there is no integumental network, which must, therefore, be regarded as secondary ; but the anterior nephridia, at any rate, are connected on each side by a continuous longitudinal duct lying within the coelom. Author is more inclined to compare this system to the nephridial system of *Cestoda*, &c., rather than to the intracoelomic network of those *Oligochæta* which possess a diffuse nephridial system (*Perichæta*).

BENHAM (1) finds that in the aperture of the funnel of the nephridium of *Lumbricus* the space between the central ends of the marginal cells and the grooved or so-called gutter cells of the funnel, is occupied by one large crescent-shaped cell. With reference to Bourne's theory of the

course of the blood (see Bourne), author says that it seems to be different in *Microchaeta*, *Urochaeta*, and *Megascolex*. Attention is called to the fact that the nephridium of *Arenicola* and other *Polychaeta* is intercellular, while that of the *Oligochaeta* is mainly intracellular. The nephridia are, however, presumably homologous in the two groups, so that the genital ducts of the *Oligochaeta*, although the lumen is intercellular, may be modified nephridia.

BOURNE (1), in considering the question as to how the blood comes into the dorsal vessel of earthworms, comes to the same conclusion as Vejdoský [see also HORST (1)], as opposed to that of Perrier and Benham, that the blood enters the dorsal vessel in each posterior segment through the dorso-intestinal vessels, and leaves it by the dorso-tegumentary vessels. Perrier maintained the precise opposite.

HORST (5) discusses the morphology of the various parts of the genital system of the *Eudrilidae*.

See also HORST (3, 4).

#### EMBRYOLOGY, GEMMATION, REGENERATION.

BENHAM (4), budding of *Nais elinguis*, O. F. M., pp. 212-214.

BOURNE (2), gemmation of the *Naidomorpha*.

KINGSLEY (1).

RANDOLPH finds that in the regeneration of the tail in *Lumbriculus*, the new mesoderm arises in great part from specialised cells in the region of the peritoneal epithelium of the ventral longitudinal muscles, which are distinguished by their large size and presence of a cell-body. They occur in nearly every somite, and are called "neoblasts." After fission, the neoblasts of the end segment, which are arranged in a definite way, and consist of median and lateral elements, begin to divide, and give rise to great part of new mesoderm. The circular muscles arise from other smaller, probably mesodermic cells, and not from the neoblasts. The presence of neoblasts in *Nais* and *Tubifex* shows how closely related are the processes of budding and regeneration.

VEJDOVSKÝ (1 ; see also 2) gives a most detailed account of everything connected with the origin of the genital glands, maturation, and fecundation of the ovum, formation of cocoon and oviposition, &c., not only of *Rhynchelmis* but of other *Lumbricidae*. The ovaries of *Rhynchelmis* arise in the septum between the tenth and eleventh segments, but in course of growth are carried back to the fiftieth to fifty-fourth segments. With regard to the fate of the spermatozoon in the egg, author says that when it has reached the centre of the egg, its tail swells up enormously, and forms a hyaline sphere from which cytoplasmic striæ radiate out into the egg. This hyaline sphere is called the "periplast"—closely appressed to it lies the nucleus of the spermatozoon, which, however, does not long remain in that position, but wanders into the interior of the periplast. Author has observed this in the living egg (see pl. vi, fig. 14). Later the periplast begins to flatten at right angles to main axis of egg, and does so

to such an extent that the mother-perioplast becomes divided into two daughter-perioplasts, each surrounded by striæ of cytoplasm and connected together by cytoplasmic fibrillæ, in the midst of which lies the now fusiform male pronucleus. There are thus two spindle-like structures produced, viz., the *periplastic spindle*, lying, so to speak, inside a cytoplasmic spindle. Female pronucleus now wanders to centre of egg and comes into contact with the male pronucleus. Author has not actually observed the fusion. A remarkable feature in the ovum of *Rhynchelmis* is the preponderating size of the male pronucleus over that of the female. This is the only such instance yet described. The two elements are usually of equal size, while in Echinoderms the female is the larger (O. Hertwig). Author adds: "Bei *Rhynchelmis* ist es aber evident dass der männliche Vorkern die Hauptrolle spielt; er ist das thätige Element, welches auf den weiblichen Pronucleus einwirkt." Main result of author's observations is that the perioplast, or "attractionssphäre," is derived from the spermaplasma. The perioplast prepares the way for the first segmentation of the egg by the formation of the above mentioned periplastic spindle, at a time when the male and female elements have not yet fused. Author says: "Meine Auffassung des Befruchtungsvorganges lautet also dahin, dass während der Polzellenbildung das theilende Element—der Perioplast—aus dem Eie fast spurlos eliminirt wird und demnach durch das Spermaplasma in Form eines neuen, energisch sich theilenden Perioplastes ersetzt werden muss." The second Heft deals with the later stages. The gastrula of the *Lumbricidæ* is described as a pachy-gastrula. It is solid, and consists of hypoblast, arranged in two layers without a cavity between them; while the epiblast covers three-quarters of the surface. It is, therefore, very far from being an "archigastrula." Author has only been able to see one pair of teloblasts, which gives rise entirely to the mesodermic bands. Some pages (250–269) are devoted to observations on occurrence of double embryos in the *Lumbricidæ*. Author has observed formation of twins in *Lumbricus terrestris*, *A. fætida*, and *A. trapezoides*. In the latter case it is very common, but not universal, as Kleinenberg assumed. An explanation of the plates of any sort, as also pls. xxi & xxii, are conspicuous by their absence. They may appear in the next Heft.

## HIRUDINEA.

### NEW GENUS AND NEW SPECIES.

- Clepsine carinata*, *plana*, Massachusetts, WHITMAN (1, 2), n. spp.  
*Pseudobranchellion*, n. g., for *P. margói*, n. sp., Naples; ARÁTHY (1).

### NEW DESCRIPTIONS, SYNONYMS.

- BLANCHARD (3). *Limnatis nilotica*, Savigny, 1820.  
 LANG. *Hæmentaria ghilianii*, F. de Filippi.

WHITMAN (2). *Clepsine plana*: this species may or may not be identical with *C. parasitica* of Say and Verrill. Latter has no value as a species. Author draws attention to the fact that metamerism in the leeches has undergone modification in two opposite directions. Variation by centripetal reduction of the number of rings is universal; variation by multiplication of rings, characterises, as a rule, only the higher forms—*Hirudo*, *Nephelis*, &c. *Hirudo* swims, while *Clepsine* creeps.

*Clepsine carinata* = (*C. papillifera*, var. *carinata*, Verrill.) WHITMAN (1).

### BIOLOGY.

MÉGNIN (3).

WHITMAN (1) has made observations on the copulation of *Clepsine plana* and *C. carinata*. The spermatophores are placed by one individual on any point whatever of the surface of another, usually the dorsal surface. The spermatozoa are then injected through the body-wall. How the passage through the tissues is effected is left undecided. Author has followed the track of the spermatozoa from the point of penetration to the coelomic cavity in which the ovaries lie. This mode of impregnation was discovered by Lang for *Turbellaria*, in 1882, and has since been described by Plate for *Rotifera*, and Harmer for *Dinophilus*. Among leeches, it possibly occurs in all the *Rhynchobdellidæ*.

### HISTOLOGY, PHYSIOLOGY.

APÁTHY (3). BOLSIVS (1, 2) [see below, "Morphology"].

CUÉNOT. BIEDERMANN. Nervous system of *Hirudo medicinalis*, pp. 434-449.

RETZIUS (1). Nervous system of *Aulastomum gulo* and *Hirudo medicinalis*, pp. 13-28, Taf. vi-x.

ROHDE. Nervous system of *Aulastomum gulo* and *Pontobdella muricata*. Each ganglion, consisting of six distinct groups of ganglion-cells, contains also six remarkable supporting cells (Stutzzellen) described for first time. Each supporting cell gives out from all points of its surface fibrous processes, which envelope a corresponding group of ganglion cells. The ganglion cells of the central nervous system are all unipolar; but there are a number of very large peripheral ganglion cells in *Hirudinea* which are multipolar.

### EMBRYOLOGY, MORPHOLOGY.

APÁTHY (2). BERGH (see below). BÜRGER (1) (see below).

BERGH finds that in *Clepsine* where the primary epidermis is continued as the definitive epidermis, the four rows of cells which form on each side the middle layer of the germ-band (*i.e.*, lying between epidermis and the inner mesodermic layer) develop as follows:—The median series

of each side (I) forms the nerve-cord, the three lateral series (II-IV) form the circular muscles, and have nothing to do with the formation of the nephridia, which arise in the inner mesodermic layer. In *Aulastoma* the primitive epidermis becomes thrown off, and the definitive epidermis arises from the three lateral series (II-IV). The cells of these rows undergo oblique division, and in this way the products of division come to lie between the outer layer of the germ-band (i.e., the future epidermis) and the inner mesoderm-plates. These deeper-lying cells give rise to the circular muscles. The nervous system arises as in *Clepsine*, and appears for a time as a groove, which then flattens out. In addition to the cells of the neural series (I), certain cells of the primitive nerve-plexus take part in the formation of the definitive nerve-chain. Author concludes that the *Hirudinea* are very closely related to the *Oligochaeta*, and that all resemblances which they show in their structure to the flat worms are merely analogies, and not homologies.

BOLSIUS (2) gives a description of the ciliated organs of *Nepheleis*, discovered by Von Siebold in 1848. Hitherto the ciliated organs of *Nepheleis* have been considered as the coelomic funnels of the nephridia; but, as a matter of fact, they are quite distinct from the nephridia and without any relations to them. They are suspended by bands of connective tissue in capsules, the cavities of which belong to the botryoidal system of Bourne, and which are separated from the segmental organs by muscular and connective tissue. While thus being morphologically equivalent to the nephridial funnels of the *Chaetopoda*, they are physiologically quite different. Author has found that the cavity of the ciliated organ is usually filled with small loose cells like blood-corpuscles. He therefore suggests two alternative hypotheses as to the function of the ciliated organs, viz.: they may serve to keep the blood in motion in the non-contractile botryoidal system; or, they are the points from which the production of blood-corpuscles takes place.

BÜRGER (1) finds that in the larva of *Nepheleis* the coelom appears as a series of separate paired segmental cavities, formed by a splitting of the two inner layers of the germinal band. They then communicate on each side with an unsegmented median cavity, which arose in the same way as the side cavities, but subsequent to them, and which extends along the whole length of the germinal band. Its lumen is much greater than that of the side-cavities.

In consequence of the presence of the median cavity, a ventral mesenterium is not formed, as it is in the *Annelids*. Similarly, the segmental cavities never extend so far dorsally as to form a dorsal mesentery, owing to the rapid formation of mesenchym at the dorsally directed region of the somites. In *Nepheleis* the septa between the somites, which are at first thin membranes, increase enormously in bulk by rapid cell-division and form massive walls, and so in great part usurp the cavities of the somites. The tissue which is thus formed consists of a gelatinous substance, in which are scattered numerous large spherical cells. The point of origin of this mesenchym is situated in two prominent longi-

itudinal ridges, which project from the margin of the germinal band on each side. The lateral body-cavities persist, and the funnels of the nephridia eventually open into them. They are, therefore, primary coelomic cavities, and not secondary, as Bourne thought. At a later period, after the cells of the nephridial loops have become perforated, the two lateral contractile blood-vessels arise, perfectly distinct from the coelom. They appear first in the region of the oesophagus, either through a splitting of the mesoblast in the above-mentioned lateral ridges, or from the remains of the segmentation cavity which are to be found in this region. The lateral coelomic cavities meanwhile divide themselves each into two: the anterior portion remains empty and the posterior contains the nephridial funnel. The two portions remain connected by a small canal. They also remain connected with the median ventral cavity, which becomes almost filled up by the nerve-cord.

After the larva has hatched from the cocoon, the lateral cavities commence to enlarge. At an early period the epithelium of the lateral cavities and of the canals connecting them with the ventral cavity give off large round cells into the cavities themselves, which are indistinguishable from the cells of the gelatinous tissue above mentioned. They are most largely developed in an early period of the post-embryonic development, and eventually become reduced to a thin cell-layer, which takes the place of the original somatopleura and splanchnopleura. This is how Bourne came to think that the lateral cavities arose from the botryoidal tissue. The canal system of the botryoidal tissue arises from the large round cells, which become perforated in an analogous way to the cells of the nephridia. The latter arise in a similar way to that described by Bergh for *Oridrilus* and *Lumbricus*. They appear at first in the form of large round cells (Trichterzellen) at the hinder ends of the somites. These bud off cells posteriorly, which arrange themselves in series. The nephridial loops are thus formed by continued division from the "Trichterzellen." The funnel cell (Trichterzelle) itself next gives off cells which surround it in a circle. This is the first beginning of the funnel proper. As these latter cells increase in number, the original large "Trichterzelle" becomes no longer distinguishable. As previously described by Bergh, the contractile end-vesicle of the nephridium arises by invagination of the epidermis, and has no homology in the *Lumbricidae*. The ovary arises on each side from the splanchnopleur of the canal which connects the lateral somite with the ventral coelom. It lies between the sixth and seventh ganglion. The cavity, in which the ovary lies on each side, widens out and becomes separated from the ventral coelom, and is now a complete cavity by itself, viz., the ovarian cavity. Each ovarian cavity next grows ventrally towards the middle line, under the nerve-cord. They meet an invagination of the epidermis, which forms the oviduct and genital pore. The testes develop later than the ovaries, and arise on each side as a longitudinal cellular band, which has formed itself by the fusion of segmental proliferations of the peritoneum of the lateral coelom. The genital band then constricts itself off from the coelom and comes to lie



in the mesenchym under the latter. It acquires a lumen, and then forms a tube from which numerous evaginations arise to form the testicular sacs, while the original tube becomes the vas deferens. The copulatory organ arises by invagination from epidermis.

## GEPHYREA.

### NEW SPECIES.

*Bonellia pumicea*, Malay Archipelago, SLUITER, p. 111, n. sp.

*Phascolosoma macer*, Malay Archipelago, *id.* p. 114, n. sp.

*Phymosoma rhizophora*, Malay Archipelago, *id.* p. 119; *P. demanni*, Malay Archipelago, *id.* p. 121 : n. spp.

*Phoronis psammophila*, Faro, Messina, CORI, n. sp.

### NEW DESCRIPTIONS, BIOLOGY, DISTRIBUTION.

COLLIN (4) : *Echiurus chilensis*, Max Müller.

CORI : Biology and Distribution of *Phoronis*.

GARSTANG.

SHIPLEY (2) : *Phymosoma weldonii*.

SLUITER says that most species of *Phymosoma* form canals in calcareous rocks, probably boring them by means of the secretion of the numerous integumentary glands. They make their own canals, and do not creep into other holes and crevices; and they remain all their life in the same hole. *P. rhizophora* is a mud-dweller. Almost all the *Aspidosiphonida*, *Dendrostomida*, and *Clasosiphonida*, are true stone-dwellers. *Aspidosiphon gigas* is a mud-dweller. Author found five males in oesophagus of *Bonellia pumicea*.

### HISTOLOGY.

CORI (see below). CUÉNOT, pp. 593-613.

JOURDAN. WARD (see below).

### MORPHOLOGY.

CORI commences with a biological description of *Phoronis psammophila*, n. sp., from Faro, Messina. A hitherto undescribed layer enters into the composition of the wall of the tentacles. Here the epidermis is provided with a cuticle; but, contrary to what occurs in the rest of the body-wall, there is no basal membrane, but in its place there occurs a layer of supporting tissue (Stützsubstanz). Between this layer and epidermis are very delicate muscle-fibres. On the inner surface is the peritoneal lining of tentacle-cavity. Author regards the "Stützsubstanz" as a product of the somatic peritoneum. The epistome contains a cavity which passes on each side into cavity of lophophore. Muscle-fibres, present elsewhere on wall of intestine, are absent from

the stomach, and in their place is a rich reticulum of blood-vessels. Describes intracellular digestion (pp. 525-527). The food of *Phoronis* consist chiefly of Diatoms and Protozoa. Description of mesenteries, diaphragm, and body-cavities (pp. 528-534). In addition to usual main and lateral mesenteries, author describes a pair of "Nebenmesenteria" in *P. psammophila*. The Nephridium (pp. 534-539) of *Phorqnis* is what Hatschek calls a Metanephridium, since it serves both as an excretory organ and as a genital duct. Vascular system (539-549). The larger vessels possess layers of circular and longitudinal muscles, a peritoneal epithelium outside, and an endothelium inside. Author brings evidence to show that the red blood-corpuscles of *Phoronis* are derived from the endothelium. Nervous system (pp. 549-551). The lateral nerve of Caldwell does not possess a lumen.

Lophophoral organs. Sexual organs (pp. 551-559). Systematic position of *Phoronis* (pp. 560-564). Author sums up in favour of a relationship to the *Polyzoa*, although he does not consider it to be so near that *Phoronis* can be classed as an aberrant form of *Polyzoa*. Calls attention to fact that in a young *Phoronis*, just after the metamorphosis, there is only one mesentery, viz., the "Hauptmesenterium," which passes off at the end of the body into a funiculus.

WARD describes a cerebral organ in *Sipunculus nudus*, consisting of a canal opening to exterior in dorsal middle line, just behind the tentacular fold, and extending backwards to anterior ventral surface of brain, where it ends blindly with a swollen extremity. Author suggests that this organ results from the fusion of the two ciliated pits described in the larva by Hatschek. Giant cells and giant fibres are absent from the nervous system of the *Sipunculids* in contrast to the *Echiurids*.

## ROTIFERA.

### NEW GENUS, AND NEW SPECIES AND VARIETIES.

- Anurea procurva*, Ascension, *scutata*, Brisbane, THORPE, n. spp.  
*Brachionus dorcas*, Gosse, var. *spinosus*, n. var. *B. forficula*, Galicia, WIERZEJSKI (1); *B. furculatus*, Cape of Good Hope, THORPE : n. spp.  
*Callidina lutea*, *russeola*, pp. 2-33, *mülleri*, *holzingeri*, p. 44, *lejeuniae*, p. 44, ZELINKA, n. spp.  
*Dinops*, n. g., for *D. longipes*, n. sp., Guildford, WESTERN (2).  
*Distyla depressa*, Riv. Lea, *musicola*, Epping Forest, BRYCE, n. spp.  
*Floscularia torquiolobata*, Queensland, THORPE, n. sp.  
*Gastropus hudsoni*, Black Forest, IMHOF (1), n. sp.  
*Lacinularia natans*, Middlesex, Littleton, WESTERN (2), n. sp.  
*Mastigocerca cylindrica*, Black Forest, IMHOF (1), n. sp.  
*Monostyla arcuata*, Epping Forest, BRYCE, n. sp.  
*Notommata cuneata*, Devonshire, THORPE, n. sp.  
*Pleurotrocha grandis*, Wandsworth, WESTERN (1), n. sp.

*Polyarthra platyptera*, Ehr., var. *Euryptera*, n. var., Galicia ; WIERZEJSKI (1).

*Rhinops orbiculodiscus*, Donegal, THORPE, n. sp.

*Salpina cortina*, Brisbane, *id.*, n. sp.

*Schizocerca diversicornis*, Dad., var. *homoceros*, n. var., Galicia ; WIERZEJSKI (1).

See also BURN.

#### NEW DESCRIPTIONS, SYNONYMS.

*Dinops longipes* = (*Asplanchna eupoda*, Gosse, 1886) ; ROUSSELET (1).

*Limnias myriophylli* = (*Limniodides myriophylli*, Tatem) ; WESTERN (1).

*Polyarthra platyptera*, var. *euryptera*, or *P. latiremis* ; IMHOF (3, 4), WIERZEJSKI (2).

*Schizocerca diversicornis* or *Brachionus amphifurcatus* ; IMHOF (3, 4), DADAY (3).

*Oecistes mucicola*, Kellicott ; WESTERN (1).

#### ANATOMY, HISTOLOGY, &c.

HUDSON. MASIUS. ROUSSELET (2). VALLENTIN. ZELINKA, pp. 2-33.

#### BIOLOGY, FAUNISTIC.

COBELLI. DADAY (1, 2). FAGGIOLI. HOOD. HUDSON. IMHOF (2, 1). MAUPAS. WIERZEJSKI (1, 2). ZELINKA, pp. 33-48.

HUDSON suggests the following explanation of the ephippial eggs of Rotifers, namely, that they are not formed as a result of fertilization, but occur at the termination of the process of successive parthenogenetic reproduction of females, when the vigour of the ovary begins to fail, so that a single germ is no longer able to produce an embryo, but must be assisted by other equivalent germs which are separated off with it and enclosed in the ephippium.

Refers to frequent presence of spermatozoa in the perivisceral cavity, and characterizes Plate's idea as a "strange theory," but see WHITMAN (1).

GUERNE & RICHARD.

#### EMBRYOLOGY.

*Callidina russeola*, pp. 48-114, *Melicerta ringens*, pp. 114-132 ; ZELINKA.

#### GASTROTRICHA

*Dasydytes bisetosum*, n. sp., THOMPSON.

## NEMERTEA.

## NEW GENUS AND NEW SPECIES.

- Amphiporus reticulatus*, Naples, BÜRGER (2), n. sp.  
*Balanocephalus*, n. g., for *B. pellucidus*, n. sp., Naples; KENNEL (2).  
*Carinella desiderata, tubicola*, Naples, *id.* (2).  
*Oerstedia aurantiaca*, Nice, *claparedii*, St. Vaast, PLESSIS, n. spp.  
*Prosorochmus bistriatus*, Naples, BÜRGER (4), n. sp.

## BIOLOGY, FAUNISTIC.

BÜRGER (3). PLESSIS.

## HISTOLOGY.

BÜRGER (2). BÜRGER (5), Nervous System.

The latter is an important investigation carried out by means of the method of Ehrlich.

## MORPHOLOGY.

BÜRGER (4) found that in *Nemertes gracilis* and *Prosorochmus bistriatus*, n. sp., the excretory vessels are several centimetres long, instead of several millimetres, as in most forms. The excretory system consists of much branched canals opening into a main vessel on each side, which leads to the external pore. The canals are lined by a ciliated epithelium, and end in blind club-shaped dilatations, which are also lined by an epithelium. Each end-sac is provided with a mass of cilia proceeding from the thickened end into the lumen of the sac. This mass of cilia, when in full action, has appearance of a single flagellum (Winperflamme). The excretory canals embrace the lateral blood vessels very closely, but never come into open communication with them in the *Enopla*. A basal membrane covers the canals, but is absent from end-sacs. Author considers that the nephridia of *Nemertines* are genetically different structures from those of other *Platyhelminths*, in which the canals consist of perforated cells ending in a single flame-cell; while in the *Nemertines* the canals and end-sacs are lined by an epithelium consisting of innumerable cylindrical cells, and are therefore intercellular instead of intracellular.

## ENTEROPNEUSTA.

SPENGLER divides this group into following Genera:—*Balanoglossus*, Delle Chiaje, *Ptychodera*, Eschscholtz. *Glandiceps*, n. g.; *Schizocardium*, n. g.

## DEVELOPMENT.

MORGAN (1, 2) gives a detailed account of the structure of *Tornaria* (pp. 408-420), its metamorphosis (pp. 420-428), and an account of the

Nassau *Tornaria* (pp. 428-431). With regard to the relation of *Tornaria* to the Echinoderm larva, first in importance is the identity in the two cases of the anterior enterocoel and its dorsal water-pore. There is reason to believe that the ancestor of *Tornaria* had two of these water-pores, as indicated in the adult of *B. kupfferi*, and as author has found in one specimen of *B. kowalewskii*, where its presence was probably atavistic. Sometimes *Auricularia* possesses two such water-pores, as shown by Ludwig and others. In all cases where two water-pores are present, they both communicate with a single unpaired enterocoel. In both groups the anterior enterocoel comes into intimate connection with the so-called "heart." The course of the longitudinal ciliated band is practically identical in the two larvæ—the differences being capable of an easy explanation (see pp. 418 & 419). As to the differences between the two larvæ, author mentions, among others, the absence of an apical plate, eyes, and circular ciliated band in *Auricularia*. As to relationship of *Balanoglossus* to Vertebrates, author follows Bateson, adding some original observations on the gill-slits.

## TURBELLARIA.

### NEW GENERA, SPECIES AND VARIETIES.

✓ *Amphichærus*, n. g. ; GRAFF (3).

*Bipalium kewense*, var. *viridis*, n. var. ; LEHNERT, p. 310. *B. manubriatum*, SHARP, n. sp.

*Convoluta lacazii*, p. 62, *roscoffensis*, pp. 66-70, Roscoff ; GRAFF (3) : n. spp.

✓ *Enantia*, n. g., for *E. spinifera*, n. sp., Trieste, *id.* (1).

*Geoplana adæ*, *lucasi*, *M'mahoni*, *aiba*, *hoggii*, *sugdeni*, *mediolineata*, *quadrangulata*, *walkhallæ*, *fletcheri*, Victoria, DENDY, (1) pp. 73-78, n. spp. *G. quadrangulata*, var. *wellingtoni*, n. var. *G. ventropunctata*, *howitti*, Victoria, DENDY (2); *G. ventrolineata*, *dubia*, *G. alba*, var. *roseolineata*, n. var., *howitti*, var. *obsoleta*, n. var., *G. adæ*, var. *extralineata*, n. var., Victoria, *id.* (3); *G. dendyi*, *frosti*, Victoria, SPENCER, pp. 86-88 : n. spp.

✓ *Monoporus*, n. g. ; GRAFF (3).

*Rhynchodemus simulans*, Victoria, DENDY (3); *R. victoriae*, Victoria, *id.* (1) p. 79 : n. spp.

### FRESH DESCRIPTIONS, ANATOMY, HISTOLOGY.

DENDY (1) : *Geoplana cærulea*, Moseley, and *G. quinquelineata*, Fletch. & Ham., pp. 70-72.

DENDY (4).

GRAFF (2, 3) : monograph of *Acela*.

KONINGSBERGER.

LEHNERT : *Bipalium kewense*, pp. 330-342, *Geodesmus bilineatus*.

SPENCER: *Geoplana sulphureus*, p. 89, *G. munda*, Fletch. & Ham. pp. 89 & 90.

WAGNER.

### NOTES, BIOLOGY, SYNONYMS.

COLLIN (2): (*Planaria abscissa*, Ijima), = *P. alpina*.

DENDY (1): Biology, pp. 66-70.

GRAFF (3): *Monoporus rubropunctatus* = (*Proporus rubropunctatus*, O. Schm). *Convoluta saliens* = (*Cyrtomorpha saliens*); *C. roscoffensis* = (*C. schultzei*), pro parte. *Amphichaerus cinerea* = (*Convoluta cinerea*).

LEHNERT: Biology, regeneration, &c.

SHIPLEY (1).

VOIGT (2).

### MORPHOLOGY, &c.

VON GRAFF (1) returns to consideration of a *Polyclade* which he discovered in Aug. 1876, under a stone at Trieste, and has not since met with. It is characterised by the possession of marginal chitinous bristles, and is placed in a new family—the *Enantiade*—the peculiarities of which are, absence of suckorial disc and tentacles. Mouth anterior, immediately behind brain. Absence of anterior median branch of intestine. The intestinal branches anastomose. Male copulatory apparatus lies immediately behind pharynx, and is directed forwards. Female apparatus opens immediately behind male, and possesses a strongly developed accessory vesicle or Bursa seminalis. Four eye-spots in region of ganglion, but none at margin of body.

VON GRAFF (3) produces a valuable monograph of the *Acala*, which cannot be adequately summarised here. The ventral surface of the *Acala* is richer in glands than the dorsal; this difference being very striking in the case of *Convoluta saliens*. The Sagittocysts of the two green *Convolutae*, *C. roscoffensis* and *C. schultzei*, only occur from the region of the female genital opening to the hinder end of body, where they are most numerous. Their number varies greatly, 100 being the maximum. They are present in their fully developed form at time of ripening of male genital organs, and are probably to be regarded as "Reizmitteln bei der Begattung." The mouth of the *Acala* is always ventral, and never leads directly into the parenchyma, but always into a pharyngeal tube of varying length. Structure of the parenchym (pp. 14-27). This is more complicated than hitherto believed, and varies greatly in constitution from species to species. Nervous system (pp. 28-37). The existence of a nervous system in the *Acala* was discovered in the green *Convoluta* of Roscoff, by Yves Delage, in 1885. The otolith lies constantly underneath the brain, either in a depression of it, or distinct from it, and held up by two nerves.

Frontal organ (pp. 40-46). This organ (first described by Delage in

*Convoluta*) lies imbedded in the anterior end of the body, and in *Amphichærus* it fills the whole space between the brain and the front end. Delage described it as a nervous organ. It is really a glandular organ, consisting of an aggregation of unicellular gland-cells, which are provided with long duct-like processes which abut at the anterior extremity of the body. The frontal organ of the *Acæla* is represented by homologous structures in the *Rhabdocæla*, *Alloiocæla*, *Tricladæ*, *Polycladæ*, and even *Nemertines*. The structure of the genital organs (pp. 46-48) is of great importance for Systematic purposes.

With regard to the Systematic position of the *Acæla* (pp. 49-52), author still thinks that they are the most primitive *Turbellarians*, and he does not seek for the ancestors of the latter among the *Ctenophora*, but looks to such a form as *Trichoplax adharens* of F. E. Schulze. Author has distinguished an integumentary muscle-layer in *Trichoplax*.

The genera of *Acæla* are classified as follows :—

#### 1. *Familia Proporida.*

*Acæla* with one genital opening.

1. Genus *Proporus* (s. str.). No Bursa seminalis.
2. Genus *Monoporus* (n. g.). With Bursa seminalis.

#### II. *Familia Aphanostomida.*

*Acæla* with two genital openings, the female situated in front of the male, with Bursa seminalis.

3. Genus *Aphanostoma*. Bursa seminalis unarmed.
4. Genus *Convoluta*. Bursa seminalis with one chitinous mouthpiece.
5. Genus *Amphichærus* (n. g.). Bursa seminalis with two symmetrically-placed mouthpieces.

Description of species, pp. 53-74. The genus *Cyrtomorpha* disappears, its species being relegated to *Convoluta*. *Nadina* awaits further investigation.

HABERLANDT finds that the chlorophyll-cells of *Convoluta roscoffensis* possess a similar organization to that of certain lower *Algæ*. But they have no cell-wall, and when isolated are unable to form one. They are incapable of leading an independent existence. Phylogenetically they are undoubtedly derived from *Algæ*; but their adaptation to a symbiotic mode of life has reached such a stage that they form a definite and inseparable portion of the tissues of the worm, namely, they constitute its assimilating tissue. The adult worms apparently do not take up nourishment in any other way than through the mediation of the chlorophyll-cells.

WOODWORTH describes structure of *Phagocata*, a *Triclad* which is remarkable in possessing, besides the median pharynx which opens into the intestine at the junction of its three main trunks, many additional pharynges, which are joined to the two lateral trunks of the intestine. They all lie in a common chamber, which embraces the middle half of

the body, and are protruded to the exterior through a single orifice. The formation and function of the rhabditi are discussed, and the origin of the yolk-glands, which grow out from two compact cell-masses attached to the ovaries, called the "parovaria."

## ACANTHOCEPHALA.

### NEW SPECIES.

*Echinorhynchus ninnii*, STOSSICH (1) ; *E. croaticus*, *id.* (3) : n. spp

### BIOLOGY, DEVELOPMENT, ANATOMY.

BRAUN (2). HAMANN (1), Pædogenetic origin of *Echinorhynchus agilis* and *E. clavæceps*. HAMANN (2). KAISER. MÉGNIN. STILES (3). ZSCHOKKE (4).

## NEMATODA.

### NEW GENERA AND SPECIES.

- Anticoma typica*, Ceylon, COBB, (1) p. 768, n. sp.  
*Aphelenchus fragariæ*, *ormerodis*, RITZEMA BOS, n. spp.  
*Ascaris cynonycteridis*, *gestri*, PARONA, (2) p. 768 ; *A. micropapillata*, STOSSICH (3) : n. spp.  
*Dipeltis*, n. g., for *D. minor*, Ceylon, *typicus*, Naples, n. spp. ; COBB (2).  
*Filaria bhamoensis*, *macrophallos*, PARONA, (2) p. 777 ; *F. monticelliana*, STOSSICH (3) ; *F. gasterostei*, STILES (2) : n. spp.  
*Heterakis differens*, SONSINO (4) ; *H. fææ*, PARONA, (2) p. 769 : n. spp.  
*Mermis hyalina*, from the Mollusc *Hyalina cellaria*, LINSTOW, (3) p. 245, n. sp.  
*Monohystera normandica*, MAN, p. 169, n. sp.  
*Oncholaimus* (*Viscosia*, n. subg.) *langrunensis*, MAN, p. 186, n. sp.  
*Oncholaimellus*, n. g., for *O. calvadosicus*, n. sp. ; MAN, p. 190.  
*Onyx*, n. g., for *O. perfectus*, Naples, COBB (2), n. sp.  
*Physaloptera varani*, PARONA, (2) p. 776, n. sp.  
*Rhabditis coarctata*, LEUCKART (2), n. sp.  
*Rictularia elviræ*, PARONA, (2) p. 771, n. sp.  
*Spilophora tentabunda*, MAN, p. 177, n. sp.  
*Strongylus otolicni*, BENEDEN, n. sp.

### NEW DESCRIPTIONS, ANATOMY, NOTES.

BERGMANN.

BLANCHARD (4) : Note xvi. *Ascaris canis*, Werner, 1782. Note xvii. *Heterakis inflexa*, Zeder, 1800. Note xviii. *Trichocephalus leporis*, Frölich, 1789. Note xix. *Strongylus tipula*, P. J. van. Ben. 1873.

BÜRGER (6) : anatomy of *Nectonema agile*, Verr.

CHATIN (1, 2) : *Heterodera schachtii*.



COBB (1): *Anticoma eberthi*, Bast., *A. acuminata*, Eberth., and *A. leptura*, Marion.

HAMANN (1): anatomy of *Nemathelminths*.

HOYER: LEIDY (1): *Ascaris anoura*, Duj.

LINSTOW (1): *Filaria tricusps*, Fedt.

MONIEZ (2): *Allantonema rigida*, v. Siebold.

RAILLIET (4): *Strongylus arnfieldi*, Cobbold.

STILES (1, 2): *Mermis crassa*, v. Linst.

See also LEICHTENSTERN, PERONCITO (1), and SONSINO (2).

#### SYNOPSIS, SYNONYMS.

COBB (2): *Dipeltis cirrhatus* = (*Enoplus cirrhatus*), Eberth.

LINSTOW (1): *Filaria attenuata* and *F. tricusps* distinct.

PARONA (2): synopsis of gen. *Rictularia*, p. 775.

VOIGT (1): *Heterodera radiculicola*, Greef, and *H. schachtii*, Schmidt, distinct.

STOSSICH (2): Genus *Dipharagus*.

#### BIOLOGY, DEVELOPMENT.

KÜHN. LEUCKART (2).

LINSTOW (2, 3) says *Pterostichus niger* is the host of the larvæ of *Gordius tolosanus*. The beetles get drowned in puddles, and so the larvæ get into the water. The males are more frequent than females in proportion of about seven to three. Duration of life is one year. After copulation the females twist themselves round thin plant stalks in the water and stick on to them the white egg-bands. The first spawning was observed on 14th April and the last on 2nd August, and it appears to last four weeks for each female. The white egg-masses become brown in twenty-four hours. Embryonic development takes up about four weeks. The embryos are presumably brought out of the water by *Ephemeridæ*, and are ultimately eaten by beetles. Author found larvæ of *Mermis crassa* in body-cavity of *Chironomus plumosus*.

MONIEZ (1).

STRASSEN says *Filaria rigida* lives free in body-cavity of *Aphodius fimetarius*. Mouth, intestine, and anus are absent. Nourishes itself by endosmosis. Embryonic development takes place in uterus. There are two forms of larvæ, differing in development of genital organs. One begins to form female elements and the other male. The former appears, however, never to reach maturity, and is suggested to be a degenerate female of no more service in preservation of species, while the latter is a protandric hermaphrodite. The larvæ at a certain period wander through the wall of the intestine of the *Aphodius*, and so to the outer world. Moniez has apparently brought some young *Rhabditidæ*, which often occur under the wing-covers, erroneously into a genetic relation with the *Filaria*.

VILLOT. ZSCHOKKE (4).

## CESTODA.

## NEW GENERA, SPECIES AND VARIETIES.

- Acanthobothrium paulum*, LINTON, (1) p. 816, n. sp.  
*Anoplocephala blanchardi*, MONIEZ, (4, Note viii) p. 75 ; *A. cuniculi*, BLANCHARD, (4, Note vii), p. 447 : n. spp.  
*Anthobothrium laciniatum*, p. 754, *A. pulvinatum*, p. 759, LINTON (1), n. spp.  
<sup>↓</sup>*Anthocephalum*, n. g., for *A. gracile*, n. sp. ; LINTON (1) pp. 794-796.  
<sup>↓</sup>*Bertia*, n. g., for *B. studeri*, *satyri*, n. spp. ; BLANCHARD (5).  
*Dibothrium restiforme*, LINTON, (1) pp. 722-728, n. sp.  
<sup>↓</sup>*Discocephalum*, n. g., for *D. pileatum*, n. sp. ; LINTON, (1) pp. 781-787.  
<sup>↓</sup>*Echinocotyle*, n. g., for *E. rosseteri*, n. sp. ; BLANCHARD (4, Note vi).  
<sup>↓</sup>*Lecanicephalum*, n. g., for *L. peltatum*, n. sp. ; LINTON, (1) pp. 802-805.  
*Ligula catostomi*, LINTON (2), n. sp.  
<sup>↓</sup>*Moniezia*, n. g., BLANCHARD (4, Notes vii and viii).  
*M. neumanni*, p. 67, *nullicollis*, p. 68, n. spp., *M. alba* var. *dubia*, n. var., p. 72, *M. ovilla* var. *macilenta*, n. var., p. 73, MONIEZ (4, Note vi).  
*Ophryocotyle insignis*, LÖNNBERG (3), n. sp.  
<sup>↓</sup>*Otobothrium*, n. g., for *O. crenucolle*, n. sp. ; LINTON, (1) pp. 849-853.  
*Phyllobothrium foliatum*, LINTON, (1) pp. 787-794, n. sp.  
<sup>↓</sup>*Platybothrium*, n. g., for *P. cervinum*, n. sp. ; LINTON, (1) pp. 820-823.  
<sup>↓</sup>*Rhinebothrium*, n. g., for *R. flexile*, pp. 768-771, *cancellatum*, pp. 771-775, *longicolle*, pp. 775-778, n. spp. ; LINTON (1).  
*Rhynchobothrium tumidulum*, p. 829, *hispidum*, p. 833, *longispine*, p. 835, *tenuispine*, p. 837, *heterospine*, p. 839, *imparispine*, p. 840, *wageneri*, p. 843, *longicorne*, p. 847, LINTON (1), n. spp.  
*Syndesmobothrium filicolle*, LINTON, (1) p. 861, n. sp.  
*Tenia nigropunctata*, *pluriuncinata*, CRETY ; *T. bifurca*, *integra*, HAMANN (3) ; *T. erostis*, *tetrabothrioides*, LÖNNBERG (3) ; *T. macrocotylea*, p. 160, *coryphicephala*, p. 161, *diesingii*, p. 168, MONTICELLI (3) ; *T. paronai*, pp. 29 & 30, MONIEZ (4, Note iv) ; *T. digonopora*, PASQUALE ; *T. acridotheridis*, p. 766, PARONA (2) ; *T. medici*, STOSSICH (3) : n. spp.  
*Tetrarhynchus tenue*, p. 853, *robustum*, p. 855, LINTON (1), n. spp.  
<sup>↓</sup>*Tylocephalum*, n. g., for *T. pingue*, n. sp. ; LINTON, (1) pp. 805-809.

## NEW DESCRIPTIONS, ANATOMY.

- BLANCHARD (4, Note vi) : *Davainea proglottina*, pp. 429-433, and *Ophryocotyle* (Friis, 1869), pp. 440-443 : (Note viii) *Moniezia gazzei*, *pectinata*, *marmotæ*, p. 452-466.  
 COLLIN : *Tenia zebrae*, Rud.  
 CRETY : *Tenia circumvallata*, Krabbe, *infundiboliformis*, Gœze.  
 FRANCAVIGLIA : *Tenia litterata*, Batsch.  
 KRÆMER : *Cyathocephalus truncatus*.  
 LEUCKART (1) : *Tenia madagascariensis*, Dav.

LINTON (1) describes afresh several species of *Dibothrium*, pp. 728-754, and species of *Echeneibothrium*, pp. 766 & 767, *Spongiobothrium*, pp. 778-780, *Orygmatobothrium*, pp. 796-799, *Crossobothrium*, pp. 799-802, *Calliobothrium*, pp. 810-816, *Rhynchobothrium*, pp. 825-829 & 845-847, *Thysanoccephalum*, pp. 823 & 824, *Tetrarhynchus*, pp. 857-861, and *Paratenia medusia*, pp. 862-866.

LINTON (2) : *Dibothrium cordiceps*, Leidy.

LÖNNBERG (2) : *Bothriocephalus plicatus*, Rud., and *Cœnomorphus linguatula*, Lönnb.

LÖNNBERG (4) : Scandinavian *Cestodes*.

MATZ : comparative study of *Bothriocephalidæ*.

MÉGNIN : *Tenia spheenocephala*, Rud.

MONIEZ (4) : Note v. *Moniezia ovilla*. Note vi. *M. benedeni*, pp. 65-67.

MONTICELLI (3) : *Tæniæ* of British Museum, pp. 151-159.

MONTICELLI & CRÉTY : anatomy of *Solenophorinæ*.

#### SYNOPSIS, SYNONYMS.

BLANCHARD (4) : Note vi. Synopsis of gen. *Davainea* : *D. circumvallata*, Krabbe, 1869, = (*Tenia pluriuncinata*, Créty, 1890) ; *D. cesticillus*, Molin, 1861, = (*T. infundibuliformis*, Duj., 1845) ; *D. urogalli*, Modeer, 1790, = (*T. tumens*, Mehlis, and *T. microps*, Dies, 1851) ; *D. frontina*, Duj., 1845, = (*T. crateriformis*, Rud., 1810, pro parte) ; *D. tetragona*, Molin, 1861, = (*T. bothrioplites*, Piana, 1881) ; *D. columbæ*, Zeder, 1800, = (*T. crassula*, Rud., 1819).

BLANCHARD (4) : Note vii. *Anoplocephalinæ*. Synopsis of *Moniezia*, pp. 444-446. *Anoplocephala*, Ém. Blanchard, 1868, = (*Plagotenia*, Peters, 1871).

BLANCHARD (4) : Note viii. *Moniezia gæzei*, = (*Dipylidium latissimum*, Riehm, 1881) ; *M. pectinata*, = (*D. pectinatum*, Riehm.) ; *M. marmotæ*, = (*T. marmotæ*, Frölich, 1802).

MONIEZ (4) : Note vii. Synopsis of *Cestodes* of sheep.

MONTICELLI & CRÉTY : *Solenophorinæ*.

#### BIOLOGICAL NOTES, MEDICAL NOTES, AND TREATISES.

BITOT & SABRAZÉS. BLANCHARD (1).

BLANCHARD (4) : Note ix. *Hymenolepis nana*. Up to present only one case has been observed in England, viz., by Ransom, p. 466.

BLANCHARD (9). BLESSIG. CUNEO. GUILLEBAU (1, 2). HASWELL. KÖNIG. LANGENBUCH. LOMINSKY. MAGGIORA. MONIEZ (3). MOROT. NEUMANN. PERRONCITO (2, 3). RAILLIET (2). SZCZYPORSKI. VIERORDT. VOIGT (3). SONSINO (8). ZSCHOKKE (4).

#### DEVELOPMENT, MIGRATIONS.

BLANCHARD (2).

HAMANN (3) describes two new *Cysticeroids* which have a remarkable

resemblance to the Cercariæ of *Trematodes*. They both occur in the body-cavity of *Gammarus pulex*. The tail of these forms is regarded as homologous with the tail of the Cercaria, and the tailed Cysticeroids may represent primitive stages, as they are only found in Invertebrates, while the Cysticeroids of the Vertebrates have arisen secondarily from the tailed forms. The *Tænia* belonging to the new Cysticeroids probably occur in birds, and are named (though as yet unknown) *T. bifurca*, n. sp., and *T. integra*, n. sp.

LINSTOW (4). LINTON (3).

MONIEZ (4) : Notes i & ii. MONIEZ (5). MRÁZEK.

RAILLIET (1). ROSSETER.

## TREMATODA.

### NEW GENERA AND SPECIES.

*Amphistomum chordale*, BURCKHARDT, n. sp.

† *Anoplodiscus*, n. g., for *A. richiardii*, n. sp., SONSINO (5).

*Apoblema stossichii*, MONTICELLI (5), n. sp.

*Cercaria mirabilis*, BRAUN (3), n. sp.

*Didymozoon lampridis*, LÖNNBERG (2), n. sp.

*Diplostomum spathula*, *abbreviatum*, *longum*, *spathulæforme*, BRANDES (1), n. spp.

*Diplozoon nipponicum*, GOTO (2), n. sp.

*Distomum flagellatum*, MONIEZ (4, Note iii) ; *D. (Polyorchis) formosum*, SONSINO (3) ; *D. pancreaticum*, RAILLIET (3) ; *D. pedocotyli*, LEIDY (2) : n. spp.

*Fusciola americana*, HASSALL, n. sp.

*Hemistomum ellipticum*, BRANDES (1), n. sp.

*Holostomum vaginatum*, *bursigerum*, *eustemma*, *cinctum*, *bulbosum*, *ellipticum*, *megalcephalum*, BRANDES (1), n. spp.

*Microcotyle salpæ*, PARONA & PERUGIA (2) ; *M. pancerii*, SONSINO (7) : n. spp.

~ *Pseudaxine*, n. g., for *P. trachuri*, n. sp., PARONA & PERUGIA (1).

*Tristomum histiophori*, BELL ; *T. interruptum*, *levinseni*, pp. 101 & 122, MONTICELLI (4) : n. spp.

### NEW DESCRIPTIONS (ANATOMY, ETC.), NOTES.

BLANCHARD (4) : Note x. *Distoma lanceolatum*, Mehlis, 1825, pp. 466 & 467. Note xi. *D. ascidioides*, Van Ben., 1873, p. 467. Note xii. *D. heteroporum*, Duj., 1845, pp. 467 & 468. Note xiii. *D. ventricosum*, Pallas, 1774, pp. 468-478. Note xiv. *D. gigas*, Nardo, 1827, pp. 479 & 480. Note xv. *D. furionis*, O. F. M., 1788, p. 481, with figure of female genital apparatus.

BLANCHARD (8) : *Distoma heterophyes*.

BRANDES (1) : Anatomy of *Holostomidae*.

- COLLIN (1) : *Gastrodiscus sonsinoi*, Cobbold.  
 DIECKHOFF : *Octobothrium lanceolatum*, pp. 255-265 ; *O. merlangi*, pp. 265 & 266 ; *Polystomum ocellatum*, Rud., pp. 267-274.  
 JÄGERSKIÖLD (2) : *Ogmogaster plicatus*, Creplin.  
 LEIDY (1) : *Distoma crassum*, Busk., *Sclerostomum armatum*, Rud.  
 LÖNNBERG (2) : *Distomum goliath*, van Ben.  
 MONTICELLI (5) : *Apoblema (Distoma) appendiculatum* ; *A. (Fasciola) ocreatum*, Rud.  
 MONTICELLI (4) : *Temnocephalus*, p. 128.  
 PARONA & PERUGIA (1) : *Gastrocotyle trachuri*, van Ben., and *Pleurocotyle scomбри*.  
 PARONA & PERUGIA (2) : Anatomy of *Microcotylidæ*.  
 SONSINO (2).  
 ZSCHOKKE (4) : Systematic position of *Distomum miescheri*, p. 805.

## SYNOPSIS, SYNONYMS.

- BLANCHARD (6) : *Distoma clavatum*, Rud., = (*D. ingens*, Moniez).  
 BRANDES (1) : *Holostomidæ*, *Diplostomum bifurcatum* = (*Distoma bifurcatum*, Wedl.) ; *Holostomum eustemma* = (*Eustemma caryophyllum*, Dies).  
 MONIEZ (4, Note x) : *D. clavatum* and *D. ingens* not identical.  
 MONTICELLI (4) : Synopsis of gen. *Tristomum*, p. 123, and of *Epibdella*, p. 125.  
 PARONA & PERUGIA (1) : *Polystomidæ*.  
 PARONA & PERUGIA (2) : *Microcotylidæ*. Genus *Axine* distinct from *Microcotyle*.  
 PARONA & PERUGIA (3) : *Vallisia striata*, Par. & Per., = (*Octocotyle arcuata*, Sonsino).  
 SAINT-REMY (3) : Synopsis of Monogenetic Trematoda.  
 SONSINO (9) : *Octocotyle (Vallisia) striata*.

## FINER ANATOMY, HISTOLOGY.

- BRAUN (1). DIECKHOFF. GOTO (1, 2). MONTICELLI (2, 4).  
 SAINT-REMY (1, 2, 4) : Latter deals with genital apparatus of *Microbothrium*.  
 SETTI.

## BIOLOGY, DEVELOPMENT, DISTRIBUTION.

- BLANCHARD (7).  
 BRANDES (1) : Development of *Holostomidæ*, pp. 570-575.  
 BRANDES (2, 3) : Copulation of ectoparasitic Trematodes.  
 COSMOVICI : Encystment of a *Distomum* (see MONIEZ).  
 JÄGERSKIÖLD (1) : Parasites of Whales.  
 MONIEZ (4, Note ix) : Encystment of *Distomum duplicatum*.  
 PINTNER (1) : Copulation of Trematodes.

PINTNER (2): *Cercaria clausii* constantly swims about in colonies composed of 10-20 individuals united closely together by their tails. The intermediate host from which the Cercariæ were discharged in large quantities was *Trivia europæa*. The colonies are probably swallowed by the next host (possibly a *Medusa*). A free in-wandering of each individual *Distomum* is out of the question.

RAILLIET (3): Parasites of domestic animals of Japan.

SONSINO (6): Parasites of *Mugil cephalus*, &c.

ZSCHOKKE (4): Parasites of *Trutta salar*.

## MESOZOA.

† *Salinella salve*, n. g. & sp. Under this name, FRENZEL (1, 2) describes a remarkable animal, which in its outer form resembles some *Turbellaria*, e.g., *Catenula*. It is defined as an oblong, turbellarian-like animal, bluntly pointed anteriorly and posteriorly, flattened dorso-ventrally and bilateral. Normal length is 18-22 mm. The body-wall is one-cell-layered. The ventral surface is finely ciliated, while the back and sides have short seta-like processes. The mouth is anterior, sub-terminal, ventral, and is provided with strong hairs. Anus is terminal and surrounded by stiff processes. The inner ends of the cells, i.e., the ends towards the enteric cavity, have long cilia. Reproduction occurs by transverse division, and also by encystment succeeding conjugation. The larva is unicellular. Habitat—"Salinensalz-Lösung (2 %) Córdoba (Argentinien)."

SCHULZE describes the structure of *Trichoplax adherens*. The animal consists of a flat cellular mass, with differentiated dorsal and ventral surfaces, the epithelium of dorsal surface being flattened, while that of ventral surface is cylindrical, but there is neither radial nor bilateral symmetry. It is ciliated all over. The motion of the animal is amoeboid. Between dorsal and ventral epithelium is a loose meshwork of fusiform or stellate cells, many of them connected at one end with the dorsal epithelium, and at the other with the ventral epithelium by means of their processes. A basement membrane under the outer epithelium is entirely absent. The mesenchym cells are present in greater numbers towards the ventral surface, while dorsally they are separated by large vacuolar spaces. Curious pigment masses and oil globules are present in the mesenchym. The method of feeding was not observed. No differentiated cellular organs are present, and no genital elements were observed. Reproduction by equal transverse division was observed. The fission takes place in the same way as it does with *Amœba*, and does not entail any process of regeneration. The animals were kept for some years in the Aquaria of the Zoological Institutes of Graz and Vienna, which are supplied with sea-water from Trieste. It is therefore probable that they came originally from the Bay of Trieste.

# COELENTERATA.

BY

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## LIST OF PAPERS.\*

- ALCOCK, A. [See WOOD-MASON & ALCOCK (78).]
1. BEDOT. —. Sur l'*Agalma clausi* (n. sp.). Rec. Z. Suisse, v, pp. 73-91, 2 pls.
  2. BELL, F. J. Contributions to our Knowledge of the Antipatharian Corals. Tr. Z. S. xiii, pt. 2, pp. 87-92, 2 pls. Abstr. in J. R. Micr. Soc. 1891, pt. 4, p. 480.
  3. BENEDEN, E. VAN. Recherches sur le developpement de *Arachnactis*. Contribution à la morphologie des *Cerianthides*. Arch. Biol. xi, pp. 115-146, 3 pls., 3 figs. in text; Bull. Ac. Belg. (3) xxi, No. 2, pp. 179-214, 4 pls. Abstr. in J. R. Micr. Soc. 1891, pt. 3, pp. 354 & 355.  
— [See also CERFONTAINE (10).]
  4. BIDGOOD, J. *Cordylophora lacustris*. Nature, xliv, No. 1127, p. 106.
  5. BIGELOW, R. P. Notes on the Physiology of *Caravella maxima*. Johns Hopk. Univ. Circ. x, No. 88, pp. 90-93, 1 fig. Abstr. in J. R. Micr. Soc. 1891, pt. 4, p. 482.
  6. BRAUER, A. Ueber die Entwicklung von *Hydra*. Z. wiss. Zool. lii, Heft 2, pp. 169-216, 4 pls. Abstr. in J. R. Micr. Soc. 1891, pt. 2, pp. 609 & 610, and Am. Nat. xxv, pp. 1027-1029.
  7. —. Ueber die Entstehung des Geschlechtsprodukte und die Entwicklung von *Tubularia mesembryanthemum*. Z. wiss. Zool. lii, Heft 4, pp. 551-579, 3 pls.; Naturwiss Rundschau, vii, No. 8, pp. 94-96. Abstr. in J. R. Micr. Soc. 1892, pt. 1, p. 50.
  8. BROOK, G. Descriptions of new Species of *Madrepora* in the Collection of the British Museum. Ann. N. H. viii, pp. 458-471.

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\* An asterisk prefixed to a quotation indicates that the Recorder has not seen the journal or work referred to.

9. BROOKS, W. K., & CONKLIN, E. G. On the Structure and Development of the Gonophores of a certain Siphonophore belonging to the order *Auronecta* (Hæckel). Johns Hopk. Univ. Circ. x, No. 88, pp. 87-89, 1 pl. Abstr. in J. R. Micr. Soc. 1891, pt. 4, p. 481.
10. CERFONTAINE, P. Sur l'organisation et le développement des différentes formes d'*Anthozoaires*. Bull. Ac. Belg. (3) xxi, No. 1, pp. 25-39, 2 pls.; BENEDEN, E. VAN, Rapport sur ce travail, t. c. pp. 4-8. Abstr. in J. R. Micr. Soc. 1891, pt. 3, p. 353.
11. CARLGREN, O. Beiträge zur Kenntniss des Actiniengattung *Bolocera*. Öfv. Ak. Förh. xlviii, No. 4, pp. 241-250. Abstr. in J. R. Micr. Soc. 1891, pt. 4, pp. 479 & 480.
12. —. *Protantha simplex*, n. g. & sp., eine eigenthümliche Actinie. Öfv. Ak. Förh. xlviii, No. 2, pp. 81-89, 4 figs. Abstr. in J. R. Micr. Soc. 1891, pt. 4, p. 479.
13. CHUN, C. Die Canarischen Siphonophoren in monographischen Darstellungen. I. *Stephanophyes superba*, und die Familie Stephanophyiden. Abh. Senck. Ges. xvi, 3 Heft, pp. 553-627. Separately published by Diesterweg, Frankfurt: 1891, 75 pp., 7 pls.
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15. CLAUS, C. Berichtigung in Betreff des Begriffs "Octomeral." Zool. Anz. xiv, No. 358, pp. 88 & 89.  
CONKLIN, E. G. [See BROOKS & CONKLIN (9).]
16. CRAWFORD, J. H. Further note on the *Medusæ* of St. Andrew's Bay. Ann. N. H. viii, pp. 295-297.
17. CUNNINGHAM, J. T. *Saphenia mirabilis*. J. Mar. Biol. Ass. ii, 1891, p. 194.
18. DARWIN, C. On the Structure and Distribution of Coral Reefs. Edited, with an introduction, by J. W. WILLIAMS. London (Scott): 1891.
19. DIXON, G. Y. & A. F. Report on the Marine Invertebrate Fauna near Dublin. P. R. Irish Ac. ii, 1, pp. 19-33.
20. DOLLFUS, G. F. Report on *Cælenterata*. Revue de Palæontologie for 1889. Ann. Géol. univ. Paris, vi, 1891, pp. 999-1027.
21. DRIESCH, H. Tektonische Studien an Hydroidpolypen. III (Schluss) *Antennularia*. Jen. Z. Nat. xxv, pp. 467-479, 3 figs. Abstr. in J. R. Micr. Soc. 1892, pt. 1, p. 50.
22. DUNCAN, P. M. *Madreporaria* of Fernando Noronha. J. L. S. xx, pp. 569 & 570.
23. ETHERIDGE, R., JUN. The Operculate *Madreporaria rugosa* of New South Wales. Rec. Austral. Mus. i, No. 10, pp. 201-205, 1 pl.



24. FAUROT, L. Sur le *Cerianthus membranaceus*. Mem. Soc. Zool. iv, pts. 1 & 2, pp. 66-74, 1 fig.; C.R. cxii, No. 8, pp. 443 & 444; Rev. Sci. xlvii, No. 10, pp. 312 & 313. Abstr. in J. R. Micr. Soc. 1891, pt. 4, p. 480.
25. FEWKES, J. W. An Aid to a Collector of the *Cœlenterata* and *Echinodermata*. Bull. Ess. Inst. xxiii, pp. 1-91, 59 figs. of *Cœlenterata* in text.
26. FORSSTRAND, C. Metoder för preparering och konservering af hafsdur samt några biologiska iakttagelser från Bermudas Korallfauna. Forh. Biol. Fören. Stockholm, ii, 8, pp. 108-111.
27. GÖEBELER, E. Die Entstehung der Korallen-Inseln. Ausland, lxi (1891), No. 44, pp. 875-880, No. 45, pp. 895-900, & No. 46, pp. 908-911.
28. GÖTTE, A. Claus und die Entwicklung der Scyphomedusen. Leipzig: 1891, 8vo, 64 pp., 24 figs. Gratis-Beilage zur Z. wiss. Zool. lii, 2 Hft. Abstr. in J. R. Micr. Soc. 1892, pt. 1, pp. 46 & 47.
29. GRIEG, J. A. Tre nordiske Alcyonarier. Bergens Mus. Aarsber, 1890, ii, 13 pp., 1 pl.
30. HADDON, A. C., & SHACKLETON, A. M. Revision of the British *Actinia*, Part II. Tr. R. Irish Ac. iv, pp. 609-672, 3 pls. Abstr. in J. R. Micr. Soc. 1892, pt. 2, pp. 216 & 217.
31. — & —. Reports on the Zoological Collections made in Torres Straits, 1888-89. *Actinæ*: i. *Zoanthææ*. Tr. R. Irish Ac. iv, pp. 673-701, 4 pls.  
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## II.—MORPHOLOGY.

## GENERAL.

CHUN (14) commences an important and detailed account of the *Cœlenterata* in Bronn's *Klassen und Ordnungen des Thierreichs*.

FEWKES (25) gives a brief description of the characters of some of the genera of the *Cœlenterata*, accompanied by good figures to aid the collector on the shores of New England.

SCHLUMBERGER (64) recommends  $\frac{1}{100}$  per cent. osmic acid and chlorohydrate of cocaine for killing polyps in an expanded condition.

FORSSTRAND (26) gives in Swedish a number of suggestions for killing and preserving the fish, *Crustacea*, *Cœlenterata*, and other animals of the Coral reefs.

## HYDROZOA.

BRAUER (6) gives an elaborate and careful account of the maturation of the ovum of *Hydra*, the changes observed in the germinal vesicle previous to the extrusion of the two polar bodies, the fusion of the male and female pronuclei, and the subsequent changes of the oosperm nucleus. Segmentation is holoblastic; a hollow blastula is formed, and the endoderm derived by multipolar immigration of the cells. The author considers that multipolar endoderm formation is the primitive one, notwithstanding the fact that it is only found in those forms in which there is no free-swimming blastula stage.

ZOJA (79), in studying the histology of *Hydra*, has been led to interpret as evidence of a comparatively complex nervous system, certain groups of granules and radiating filaments which he has been able to observe with distinctness.

BRAUER (7) finds that the generative cells of *Tubularia mesembryanthemum* arise from interstitial cells of the ectoderm in the gonophore stalks and migrate into the endoderm, and thence into the ectoderm of the manubrium. The embryonic endoderm arises by multipolar immigration into the blastula cavity.

DRIESCH (21) finds that the plumules of *Antennularia* are arranged in alternating whorls, varying in number within definite limits in the different species. The young form of *Antennularia* is, for the most part, plumularoid.

SPENCER (70) describes very fully the anatomy of *Ceratella fusca*, and discusses the affinities of the *Ceratellidae*.

HICKSON (35) describes fully the medusæ of *Millepora murrayi*. These medusæ only bear male gonads. The ova in this species, as in *M. plicata*, are very small, alecithal, and undergo the first stages of their development in the coenosarcial canals. The male gonads wander from the ectoderm of the canals into the ectoderm of a dactylozooid, where they form a large saucer-shaped spermarium. The dactylozooid is then metamorphosed into a medusa, which is devoid of ring and radial canals, sense

organs, velum, and mouth. The medusa escapes before the spermatozoa are mature. The author endeavours to show that this form of medusa is primitive, not degenerate, and states his views of the probable origin of the medusæ in the group. The gonangia of *Allopora* and *Distichopora* are then described, and their development traced. By the help of diagrammatic figures of these structures, a comparison is drawn between the gonangia of the *Hydrocorallinæ* and those of the *Hydromedusæ*.

HARDY (32) describes the structure of the ectoderm of the blastostyle of *Myriothele phrygia*, and the stages in the formation of the gonophore. He points out that the gonophore appears to be a curiously modified bud, and that the generative elements pre-exist as small cells, having lodgment in the tissues of the adult, and travel into the abortive bud which is their place of final development. The structure of the endoderm is also fully described, and a short discussion given of the physiology of digestion in this form.

KOROTNEFF (46) finds a form of sporogeny in *Cunocantha parasitica*.

MAAS (52) gives an account of the structure and development of the buds of *Cunina*.

MELLY (56) gives an account of the anatomy of *Spongiicola fistularis*, but he seems very doubtful whether there is only one or more species of this interesting genus to be found at Naples.

McMURRICH (53) describes the development of *Cynæa arctica*. Segmentation is regular, and a blastula is formed. A solid planula is produced by the immigration of cells. After swimming about for some time the embryos settle down and inclose themselves in a cyst. In this stage the solid endoderm becomes hollow. The mouth is formed, and then four tentacles make their appearance. Mesenteries are not formed until eight tentacles are acquired.

VANHÖFFEN (74) finds that, contrary to the statements of Hæckel, the gonads of *Turritopsis armata* are interrarial, not perrarial, in position. *Turritopsis* belongs to the *Margellidæ*, since it has solid, not hollow, tentacles, as in the *Tiaridæ*.

VANHÖFFEN (73), in giving a brief description of some observations on the anatomy of *Periphylla hyacinthina*, asserts that it possesses solid tentacles, and suggests that this genus has relations both with the *Stauro-medusæ* and with *Nausithoë*.

VANHÖFFEN (75) proposes a new classification of the *Anthomedusæ*. The two main groups in his system are : I. The *Codonidæ*, in which the gonads are not disconnected, forming a circular mantle round the gastric cavity ; and II. The *Oceanidæ*, in which the gonads are four in number, or in four pairs, and interrarial in position.

SCHLATER (62) describes the nervous system and marginal papillæ of the Lucernarian *Halicystus auricula*.

CHUN (13) gives an interesting and exhaustive account of the anatomy of *Stephanophyes superba*, and discusses the relations of the family *Stephanophyidæ*, which he places between the *Diphyidæ* and Hæckel's *Desmophyidæ*. The species is monœcious, groups of three or four male

and female gonophore bunches alternating on the same stock. The gonads originate in the endoderm of the primitive bud. A very remarkable point is that in the young ova there are, without exception, two nuclei of very different size and structure. The larger is granular, and poor in chromatin; the smaller homogeneous, and very rich in chromatin. In the older eggs the small nucleus leaves the large one, approaches the periphery, and is lost. A full description of male and female gonophores is given. Chun thinks it is probable that in such forms as this, notwithstanding Weismann's views to the contrary, we have stages in the evolution not the degeneration of the medusa.

BROOKS & CONKLIN (9) give an account of the structure and development of the gonophores of a certain siphonophore belonging to the *Auronectæ*. They show no traces of medusoid structure, but are simply egg pouches.

SCHNEIDER (65) describes the ganglia and nerve plexus in the pneumatophore and tentacles of the *Siphonophora*, *Apolemia*, and *Forskulea*, and gives an account of the histology of the nematocyst batteries in these forms.

SMITH (69) describes some early stages in the development of *Aurelia flavidula*, and points out that the gastrulation is typical, since from the beginning the archenteron is an open sac-like cavity.

GETTE (28) writes a paper of 64 pages in support of his statements and views concerning the development of *Aurelia aurita* and *Cotylorhiza tuberculata*.

CLAUS (15) in referring to Vanhoffen's paper says that he has confused the words "tetrameral" and "octomeral," with "vierstrahlig und achtstrahlig."

## ANTHOZOA.

HADDON & SHACKLETON (30) introduce the words "sulcular" and "sulcar" in place of the words "dorsal" and "ventral" in referring to the mesenteries of the *Actinæ*. Thus in a sea anemone with twelve mesenteries, there will be two sulcular directives, two sulculo-sulcular lateral, two sulco-sulcular lateral, two sulculo-sulcar lateral, and two sulco-sulcar lateral mesenteries, and two sulcar directives.

CERFONTAINE (10) describes the mode of development of the twelve primary mesenteries of *Cereactis*. The first pair divides the coelenteron into two unequal chambers, the second pair appear in the larger chamber, the third in the smaller, and the fourth pair in the space bounded by the mesenteries of the second formation. The development of the mesenteries of *Asteroides calycularis* is also described, and the order of development of the tentacles is found to be the same as in *Actinia mesembryanthemum*.

FAUROT (24) points out that the difference in length presented by the first eight mesenteries of *Cerianthus* calls to mind the disposition of parts

of the *Rugosa*, and thus supports Haime's view that the *Cerianthidae* are related to the *Rugosa*.

VAN BENEDEN (3) combats Boveri's view that the *Cerianthidae* pass through an *Edwardsia* stage, and shows that there are profound differences between the development of the *Cerianthidae* and the *Hexactiniae*. He considers that forms constituted like the *Cerianthidae* were the source of Annelids, Arthropods, and Chordates. He describes seven stages in the development of *Arachnactis*.

McMURRICH (55) discusses very fully the phylogeny of the *Anthozoa*, and gives a family tree of the group. He considers it probable that they can be traced back to an ancestral form with only four mesenteries.

McMURRICH (54) gives an account of the segmentation and formation of the germ-layers in the Hexactinian Metridium. The endoderm is formed by delamination, as in all *Anthozoa*. The same author discusses the mode of formation of the first eight mesenteries of *Rhodactis*, and considers that in this form there is no ectodermal fold, from the stomodæum entering into the formation of the mesenterial filaments. The paper concludes with an account of some of the later stages in the development of *Aulactinia*.

VON KOCII (44) shows that in the budding of *Blastotrochus* each of the two septa of the parent situated in the plane of the longest diameter, directly pass into the two primary septa of the bud.

SCHNEIDER (65) says that the spicules of *Alcyonium acaule* are formed by indifferent cells derived from the ectoderm, which coalesce here and there into groups, and by fusion give rise to structures which are considered to be the matrix element of the spicules.

STUDER (71) calls attention to a case of fission in an Alcyonarian allied to *Gersemia*.

BELL (2) describes fine specimens of *Gerardia savalia* and *Antipathes robillardi* recently received by the trustees of the British Museum.

### III.—FAUNISTIC.

SCHLATER (63) gives, in Russian, an account of the Hydroids and Medusæ of the Sulu Archipelago.

BIDGOOD (4) refers to Professor Weldon's discovery of *Cordylophora lacustris* in Norfolk.

SHEPHEARD (67) remarks that he has for many years found *Cordylophora* in the Chester and Ellesmere Port Canal, three miles from a tidal river, the Dee.

SCHERREN (61) states that numbers of colonies of *Cordylophora* were found floating on the surface, attached to weed, on both sides of the Thurm, right up to Hickling Broad.

SLOAN (68). A specimen of the Siphonophoran *Halistemma* was observed in St. Andrew's Bay. Notes on above by Professor McIntosh.

CRAWFORD (16) gives a list of the Medusæ found in St. Andrew's Bay, from August to May.



MAAS (51) comes to the conclusion that the *Agauridae* occur chiefly in the northern part of the Atlantic ocean, the *Trachymenidae* in the median part, and the *Geryonidae* in the southern part.

CUNNINGHAM (17) records the occurrence of the Leptomedusan *Saphenia mirabilis* in the plankton, near the Eddystone.

LEIDY (49) exhibited drawings of a Beroid, 1-4 inches long, from the New Jersey coast, probably identical with *Idyia roseola*, of Agassiz.

DIXON (19) gives a list of the sea-anemones found in Dublin Bay.

PROUHO (60) found *Gonactinia prolifera* on the coasts of Roussillon. The characters of the Mediterranean specimen are the same as those of the Norwegian. He describes and figures the transverse fission of this form. The stomodæum of the lower individual does not exist before the separation, but is formed by invagination subsequently. Scissiparity and sexual reproduction occur together, thus there is no alternation of generation.

LACAZE-DUTHIERS (47) calls attention to the existence of *Kophobelemnon* at Banyuls, and points out that the fauna of Roussillon is very rich in rare forms.

GRIEG (29) describes the occurrence of the three Alcyonarians, *Isidella hippuris*, *Anthothela grandiflora*, and *Clavularia arctica*, on the coasts of Norway.

#### CORAL REEFS.

LISTER (50) gives an interesting and valuable account of the living and fossil reefs of the Tonga group.

HICKSON (36) gives an account of the different forms of animal life met with on a coral reef in the East Indies, and comments on the colours and markings of the *Cælenterata*, *Arthropoda*, and *Pisces*.

GOEBELER (27) writes some articles on coral reefs.

#### IV.—PHYSIOLOGICAL.

WILSON (77) comes to the conclusion that *Hydra* has an innate tendency to wander, and that light and oxygen operate by modifying indefinite movements that tend to occur irrespectively of external stimuli.

NUSSBAUM (59) corroborates his previous conclusion that a *Hydra*, when turned inside out and fixed by a needle, recovers itself by a process of overgrowth and turning outside in. A considerable part of the paper is occupied by a discussion of Ischikawa's observations and opinions.

BIGELOW (5) describes some points in the physiology of the Siphonophoran *Caravella maxima*.

ZOJA (82) describes a number of experiments he made on Hydroids, more particularly *Podocoryne* and *Pennaria*, to determine the effect of stimuli upon the contractility of the polyps of the colony.

HARDY (32) gives an account of the physiology of digestion of *Myriothele*.

HEILPRIN (34) found a specimen of *Porites astracoides* on an anchor that had been sunk for five years. The basal growth was 1-20th of an inch.

## V.—SYSTEMATIC.

### HYDROZOA.

#### SIPHONOPHORA.

*Agalma clausi*, Villefranche, BEDOT (1), n. sp.

#### ACRASPEDA.

*Cyanæa nozakii*, loc. ?, KISHINOUE (43), n. sp..

### ANTHOZOA.

#### ACTINIARIA.

✓ *Protanthea*, n. g., CARLGREN (12). Body wall thin and smooth. The body wall is marked by twenty-four grooves, indicating the position of as many mesenteries, eight of which are complete, twelve arranged in six pairs, and four arranged so that each one pairs with the four lateral complete mesenteries. The genus is united with *Gonactinia* into a tribe *Protantheæ*. *P. simplex*, W. Coast of Sweden, n. sp.

*Bolocera longiformis*, CARLGREN (11), p. 242, W. Coast of Sweden, n. sp.

*Sagartia herdmanni*, HADDON (37) p. 199, 5-10 faths., in Killery Lough, W. Coast of Ireland, n. sp.

*Cerianthus oligopodus*, Mediterranean, CERFONTAINE (10), n. sp.

#### ZOANTHIDÆ.

HADDON & SHACKLETON (30) describe the following :—

##### New Subfamily MACROCNEMIÆ.

Zoantheæ, in which the sulcar element of the primitive sulco-lateral pair of mesenteries is perfect, p. 627, to include *Epizoanthus* (Gray), and *Parazoanthus*, n. g.

✓ *Parazoanthus*, n. g. Macrocnemic Zoantheæ, with a diffuse endodermal sphincter muscle. The body wall is incrustated; the ectoderm is always continuous; the mesogloea contains ectodermal canals, cell islets, and an encircling sinus. Dioecious. *P. axinella* = *Palythoa axinella* (Schmidt). *P. anguicoma* = *Palythoa anguicoma* (Norman). *P. dizoni*, n. sp., p. 658, W. Ireland, 70-80 faths. *P. dichroicus*, *iid.* (31) p. 698, Mer 20 faths. *P. douglasi*, *iid.* (31) p. 700, 10 faths., Albany Pass, n. spp.

*Epizoanthus macintoshi*, p. 649, Shetlands, *wrightii*, p. 651, Dublin Bay, *id.* (30) ; *E. hirondeili*, Azores, JOURDAN (39) : n. spp.

HADDON & SHACKLETON (31) also describe :—

*Zoanthus coppingeri*, p. 676, Mabuag, *jukesii*, p. 678, Murray Is., *macgillivrayi*, p. 680, Mabuag, n. spp.

*Isaurus asymmetricus*, p. 684, Mabuag, and 15–20 faths., Murray Is., n. sp.

*Gemmaria macmurricii*, p. 688, Murray Is., 20 faths., *mutuki*, p. 689, Mabuag, n. spp.

*Palythoa howesii*, p. 693, Thursday I., *P. kochii*, Thursday I. and Mabuag, n. spp.

### MADREPORARIA.

BROOK (8) describes the following new species of *Madrepora* :—  
*M. brueggemanni* = *M. laxa* (Brüggeman), p. 458, Singapore and N.E. Australia. *M. clathrata*, p. 459, Mauritius. *M. complanata*, p. 459, Seychelles. *M. concinna*, p. 460, Mauritius. *M. delicatula*, p. 461, Solomon Is. *M. diversa*, p. 461, Diego Garcia. *M. hispida*, p. 462, Philippines, Banda, Pouapé. *M. inermis*, p. 462, South Seas. *M. intermedia*, p. 463, Maldives. *M. leptocyathus*, p. 463, Samoa. *M. macrostoma*, p. 464, Mauritius. *M. ornata*, p. 464, Darnley I. *M. pacifica*, p. 465, Samoa, &c. *M. plicata*, p. 465, Tongatabu. *M. polymorpha*, p. 466, Indo-Pacific Ocean, &c. *M. polystoma*, p. 466, Mauritius. *M. procumbens*, p. 467, South Seas. *M. pulchra*, p. 468, Keeling I. and Tizard Bank. *M. samoensis*, p. 468, Samoa. *M. spathulata*, p. 469, Treasury I. and Solomon Is. *M. subglabra*, p. 470, South Seas, Fiji Reefs. *M. symmetrica*, p. 470, Mauritius.

VON HEIDER (33) makes the following emendations :—

*Astrocenia pharensis* = (*Madracis*) *pharensis* (Heller).

*Axohelia* : *Stylophora incrustans*, *Astræa decactis*, and *Reussia lamellosa* should also be included in this genus.

WOOD-MASON & ALCOCK (78) add :—

*Rhizotrochus worsleyi*, p. 5, Gaspar, Straits, deep sea, n. sp.

*Caryophyllia ephyalu*, p. 6, Andaman, 220–240 faths., n. sp.

*Stephanotrochus nitens*, p. 7, Laccadive Sea, 740 faths., n. sp.

*Goniopora fruticosa*, Torres Straits, KENT, (41) p. 123, n. sp.

*Tridacophyllia rectifolia*, New Hebrides, *id.* (41) p. 124, n. sp.

### ALCYONARIA.

#### STOLONIFERA.

*Clavularia concreta*, STUDER, (72) p. 93, 1267 metres, 46° 4' N., 49° 2' E.; *C. marioni*, KOCH, (45) p. 660, Mediterranean : n. spp.

*Callipodium astræoides*, STUDER, (72) p. 92, 63 metres, off Belle Isle, n. sp.

## ALCYONIDA.

↓ *Daniela*, n. g., VON KOCH (45). The colonies are dendriform, and not unlike *Alcyonium acaule*. The polyps are large and not retractile. The walls are very thin. *D. koreni*, Naples, p. 669, n. sp.

↓ *Oeratoaulon*, n. g., JUNGENSEN (40). Trunk subcylindrical, undivided, covered by a dark horny cuticle. Polyps non-retractile, with cœlentera descending through the trunk. Ten spicules, .05-.08 mm. Colour violet. 24 mm. in height. *O. wandeli*, p. 242, 538 metres, 66° 16' N., 25° 20' E., n. sp.

↓ *Schizophytum*, n. g., STUDER (72). The colony is formed by the tubes of polyps which spring from a common base, and are cemented together. The polyps become free at different heights. *S. echinatum*, p. 92, 130 & 318 metres, off Azores, n. sp.

*Coreopsis studeri*, KOCH, (45), p. 691, Naples, n. sp.

STUDER (72) describes the following :—

*Eunephthya racemosa*, p. 86, 1267 metres, 46° 4' N., 49° 2' E., n. sp.

*Væringia danielsseni*, p. 87, 1267 metres, 46° 4' N., 49° 2' E., n. sp.

*Anthomastus agaricus*, p. 88, loc. ?, n. sp.

*Rhodophyton variable*, p. 89, 134-240 metres, Gulf of Gascony, n. sp.

*Alcyonium clavatum*, p. 90, 318 metres, E. of Pico, Azores, n. sp.

## PENNATULIDA.

↓ *Gyrophytum*, n. g. The peduncle long, and not swollen at the base. It enlarges into a rachis, carrying a few leaves. Antozoids completely retractile, arranged in two or three very irregular series. Siphonozoids cover the two faces of the leaves. A calcareous axis runs through the peduncle. *G. hirondelli*, n. sp., p. 94, 1266 metres ; between Pico and Sao Jorge, Azores ; STUDER (72).

## FOSSIL CORALS.

NICHOLSON (58) describes the following new forms :—

*Stromatopora borealis*, p. 315, Silurian, Kattripank, Oesel.

*Actinostroma tyrrellii*, p. 317, Dolomitic limestones, Lake Winnipogis, Canada. *A. whiteavesii*, p. 320, Devonian, Little Red River. *A. matutinum*, p. 322, Chaleur group, L'Anse au Gascon, Quebec. *A. fenestratum*, p. 322, Dolomitic limestones, Lake Manitoba.

*Syringostroma nodulatum*, p. 325, Devonian, Kelly's Limestone, Ohio, and *S. densum*, p. 327, from the same locality.

## SPONGIÆ.

BY

E. A. MINCHIN, B.A.

## INTRODUCTION.

THE number of titles this year is 68, among which are included a certain number belonging to 1890, which the Recorder for that year was unable to obtain.

A large proportion of the morphological works of 1891 deal with the *Calcarea*. Their anatomy and histology are discussed by DENDY (1, 4), VON LENDENFELD (1), and BIDDER ; while RAUFF (1) describes in detail the structure and mode of growth of a most interesting new group of fossil Sycons, which he terms *Polysteganina*. KELLER has many remarks on the anatomy of *Oligoceratina* and *Tetractinellida*, and also an interesting and important theory on the origin of spongin and the mechanical adaptation of the sponge skeleton to external conditions of life. DENDY (2) describes the flagellated chambers of *Halichondria panicea*, in which he asserts, against von Lendenfeld [see Zool. Rec. 1890], the presence of Sollas's membrane, which he has found also in various *Calcarea*. [See also DENDY (1, 4).]

In embryology, DELAGE has some very extraordinary statements concerning the development of *Spongilla*, which will certainly need abundant confirmation before they can be accepted, the more so as the author gives us no clue as to the methods employed by him in arriving at such novel results. WILSON describes what he terms the gemmule development of some species of *Monaxonida* ; but it would appear probable, even from his own figures, that what he has mistaken for gemmule formation is in reality the segmentation of the ovum.

DENDY (4) gives a classification of *Homocela* which has very little in common with that given by VON LENDENFELD (1, 3) in his classification of *Calcarea* in general. KELLER (1) introduces some changes in the classification of *Monaxonida*. Important systematic works are : for recent forms, DENDY (4), KELLER (1), VON LENDENFELD (1), TOPSENT, WEBER,

and WELTNER; for fossil forms, DAWSON, HALL, HINDE (1), JAMES, MATTHEW, POČTA, and WALCOTT. The problematic fossil *Palæospongia prisca*, is asserted to be a Sponge by BORNEMANN and denied by RAUFF (2).

Important general works on Sponges are WELTNER'S valuable account of the *Spongillideæ*, and PERRIER'S brief account of Sponges in his "Traité de Zoologie."

## I.—LIST OF PUBLICATIONS.\*

ALCOCK, A. [See WOOD-MASON & ALCOCK.]

ANON. The Genus *Stelletta*. Review of "Die Gattung *Stelletta*. Unter Mitwirkung von F. E. Schulze. Bearbeitet von R. von Lendenfeld. Mit 10 Tafeln (Berlin, Georg Reimer: 1890)." Nature, Jan. 29, 1891, xliii, p. 292.

LO BIANCO, S. Metodos usados en la Estación zoológica de Napoles para la conservación de los Animales Marinos. An. Soc. Esp. xx, pp. 273-322.

Translation by D. MANUEL CAZURRO of the memoir by Lo Bianco in M.T. z. Stat. Neap. [See Zool. Rec. 1890.] [See also GROULT.]

BIDDER, G. Review of Dendy's "Monograph of the Victorian Sponges. Part I. The Organization and Classification of the *Calcarea Homocela*, with Descriptions of the Victorian Species." Q. J. Micr. Sci. (n.s.) xxxii, pt. 4 (Oct., 1891), pp. 625-632.

Reprinted as "Notes on Calcareous Sponges."

BÖHM, J. Kreidebildungen des Fürbergs und Sulzbergs bei Siegsdorf in Oberbayern. Palæontogr. xxxviii, lief 1 & 2, pp. 1-106, taf. i-v.  
1 Sponge, † *Ventriculites*, sp. indetermin., p. 105.

BORNEMANN, J. G. Die Versteinerungen des cambrischen Schichtensystems der Insel Sardinien. N. Acta Ac. L.-C. Nat. cur. lvi, No. 3, pp. 427-528, taf. xix-xxviii.

*Palæospongia prisca*, pp. 492-494.

BRUNCHORST, J. Die biologische Meeresstation in Bergen. Bergens Mus. Aarsber. for 1890 (1891), No. 5, 31 pp., with 5 pls. and 2 figs. in the text.

Sponge fauna of Bergen, p. 31.

CHATIN, J. Nucleus of Sponges. J. R. Micr. Soc. 1891, pt. 1, p. 54.

Abstract of the paper by the same author in C.R. cxi, No. 23, p. 889. [See Zool. Rec. 1890.]

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\* An asterisk prefixed to a quotation indicates that the Recorder has not seen the Journal or Work referred to.

- DAWSON, J. W. On new Species of Fossil Sponges from the Siluro-Cambrian at Little Metis on the Lower St. Lawrence (including Notes on the Species by G. J. HINDE). Tr. R. Soc. Canada, vii, 1889 (1890), sect. iv, pp. 31-55, pl. iii, 25 woodcuts.
- DELAGE, YVES. (1) Sur le développement des éponges (*Spongilla fluviatilis*). C.R. cxiii, No. 5 (3rd August, 1891), pp. 267-269. Translated in Ann. N. H. (6) viii, No. 46, pp. 331-333. Abstract in J. R. Micr. Soc. 1891, pt. 6, p. 751.
- . (2) Sur le développement des Spongilles. C.R. Ass. Fr. Sci. xix (1890), pp. 509-511.
- DENDY, A. (1) Studies on the Comparative Anatomy of Sponges. III. On the Anatomy of *Grantia labyrinthica*, Carter, and the so-called Family *Teichonidæ*. Q. J. Micr. Sci. (n.s.) xxxii, pp. 1-39, pls. i-iv. Abstract in J. R. Micr. Soc. 1891, pt. 2, pp. 204 & 205.
- . (2) Studies on the Comparative Anatomy of Sponges. iv. On the Flagellated Chambers and Ova of *Halichondria panicea*. Q. J. Micr. Sci. (n.s.) xxxii, pp. 41-48, pl. v. Abstract in J. R. Micr. Soc. 1891, pt. 2, pp. 204 & 205.
- . (3) *Synute pulchella*. J. R. Micr. Soc. 1891, pt. 5, p. 611.  
Abstract of a memoir in the P. R. Soc. Vict. which is not yet published.
- . (4) Monograph of the Victorian Sponges. Part I. The Organization and Classification of the *Calcarea Homocæla*, with Descriptions of the Victorian Species. Tr. R. Soc. Vict. iii, 1 (1891), pp. 1-82, pls. i-xi. Abstract in J. R. Micr. Soc. 1891, pt. 5, pp. 610 & 611. Review by BIDDER, q.v.
- FELIX, J. Versteinerungen aus der mexicanischen Jura- und Kreide-Formation. Palæontogr. xxxvii, lief. 5 & 6 (March, 1891), pp. 140-194, taf. xxii-xxx.  
1 Sponge, †*Stellispongia bernensis*, Et., sp., p. 172.
- GOURRET, P. La Faune Tertiaire Marine de Carry, de Sausset, et de Couronné (pres Marseille). Bull. de la Soc. Belge de Geologie, Palæontologie, et d'Hydrologie, iv, pp. 73-143 [p. 32, *infra*].
- GROULT, P. (1) Conservation des Animaux Marins. Le Nat. lxxxii, v (1891).  
Sponges, p. 148, with figure of *Axinella*. Translation of LO BIANCO.
- . (2) Les Éponges. T. c. pp. 290-292, 2 figs.  
A popular account of the zoology and fisheries of Sponges.
- HALL, J. On New Genera and Species of the Family *Dictyospongiidæ*. [Abstract.] Bull. Geol. Soc. America, i, pp. 22 & 23.
- \*HAMILTON, A. On Sponges: their Life History. [Title only.] Tr. N. Z. Inst. xxii, p. 553 (in Proceedings of Hawke's Bay Philosophical Institute).

HANITSCH, R. Notes on some Sponges Collected by Professor Herdman off the West Coast of Ireland, from the 'Argo.' P. Liverp. Biol. Soc. v, pp. 213-222, pls. xi & xii.

HERDMAN, W. A. Fourth Annual Report of the Liverpool Marine Biological Station on Puffin Island. *T. c.* pp. 19-67.

HINDE, G. J. (1) A new Fossil Sponge from the Utica Shale Formation (Ordovician) at Ottawa, Canada. *Geol. Mag. (n.s.)* Dec. iii, vol. viii, No. 1, pp. 22-24, 1 woodcut.

— (2) Notes on Specimens of Cherty Siliceous Rock from South Australia. *T. c.* pp. 115 & 116.

Contains indeterminable sponge spicules, acerate and four-rayed.

HOLMES, W. M. Freshwater Sponges. Proceedings and Transactions of the Croydon Microscopical and Natural History Club, 1891, pp. 275-277.

A popular account.

IMHOF, O. E. Ueber die pelagische Fauna einiger Seen des Schwarzwaldes. *Zool. Anz.* No. 355 (2nd Feb., 1891), xiv, pp. 33-38.

Occurrence of spicules of *Spongilla* in some of the lakes.

JAHN, J. Ueber die in den nordböhmischen Pyropensanden vorkommenden Versteinerungen der Teplitzer und Priesener Schichten. *Ann. Hofmuseum Wien*, 1891, vi, Nos. 3 & 4, pp. 465-486 [pp. 20, 22, & 25-27, *infra*].

JAMES, J. F. Manual of the Palæontology of the Cincinnati Group. *J. Cincinnati Soc.* xiv, 1, pp. 45-72.

JENNINGS, A. V. On a Variety of *Alectona millari* (Carter). *J. L. S.* xxiii, No. 148, pp. 531-539, pl. xiii,

KATZER, F. Ueber die Spongienreste im Devon von Böhmen. *Verh. geol. Reichsanst.* 1890, p. 114. Abstract of the paper by the same author in the *SB. Ak. Wien*, 1888, Abth. i, pp. 300-310 [see *Zool. Rec.* 1888].

KELLER, C. (1) Die Spongienfauna des rothen Meeres (II Hälfte). *Z. wiss. Zool.* lii, pp. 294-368, taf. xvi-xx. Abstract in *J. R. Micr. Soc.* 1891, pt. 5, p. 611.

— (2) Das Spongin und seine mechanische Leistung im Spongienorganismus. Festschrift zur Feier des fünfzigjährigen Doctor Jubiläums Herrn Prof. Dr. Karl Wilhelm von Nägeli in München und Herrn Geheimrath Prof. Dr. Albert von Kölliker in Würzburg gewidmet von der Universität, dem Eidg. Polytechnikum, der Thier-Arzneischule in Zurich (Zurich, 1891), pp. 149-160, 1 pl.

KINGSLEY, J. S. Record of American Zoology. *Am. Nat.* xxv, No. 291, pp. 252, *et seq.*

Sponges, pp. 253 & 254.



LEIDY, J. Note on the Boring Sponge of the Oyster. P. Ac. Philad. 1891, p. 122.

*Raphyrus griffithsii* identical with *Cliona celata*, Grant.

LENDENFELD, R. VON. (1) Die Spongien der Adria. I. Die Kalkschwämme. Z. wiss. Zool. liii, Heft 2 (1891), pp. 185-321 (First half), and Heft 3 (1891), pp. 361-433 (Second half). Introduction (pp. 185-187). I. Literature, pp. 187-190. II. Analytical part, pp. 191-321 & 361-374. III. Synthetical part: Calcareous Sponges in general, pp. 375-433.

— (2) Ueber die Kieselnadeln von *Geodia*. Zool. Anz. xiv, No. 377 (16th Nov., 1891), pp. 407-409.

— (3) Das System der Kalkschwämme. SB. Ak. Wien, c, Abth. i, Heft i-iii, pp. 4-19. Abstract in J. R. Micr. Soc. 1891, pt. 5, p. 611.

— (4) Bemerkungen über die Spongien im Kanal von Lesina. Zool. Gart. xxxii, No. 9, pp. 263-265.

An account of some of the Sponges of Lesina, and their habitats.

— (5) Classification of Sponges. J. R. Micr. Soc. 1891, pt. 6, p. 751. Abstract of paper in Abh. Senck. Ges. xvi, pp. 361-439 [*vide* Zool. Rec. 1890].

MACKAY, A. H. Freshwater Sponges of Canada and Newfoundland. Tr. R. Soc. Canada, vii, 1889 (1890), Sect. iv, pp. 85-95, pl. iv.

MARTIN, J. Aperçu Général de l'Histoire Géologique de la Côte d'Or. Mem. Ac. Dijon (4) ii (1891) pp. 25-135.

List of fossils, with several Sponges. /

MATTHEW, J. F. (1) On Cambrian Organisms in Acadia. Tr. R. Soc. Canada, vii, Sect. iv, pp. 135-160, pls. v-ix.

— (2) On the Occurrence of Sponges in Laurentian Rocks at St. John, N.B. Bull. Nat. Hist. Soc. New Brunswick, ix, pp. 42-45, figs. 1 & 2.

MILLER, S. A. Palæontology. Advance Sheets from the 17th Report of the Geological Survey of Indiana, August, 1891 [pp. 32 & 33, *infra*].

NORMAN, A. M. The genera *Cyclostoma* and *Pomatias*, and on a misapplied rule of Zoological Nomenclature. Ann. N. H. (6) vii, pp. 447-451.

Discusses the use of the generic names *Normania*, Bwk., and *Pæcillastra*, Soll., pp. 449 & 450.

PERRIER, E. Traité de zoologie. Paris.

The Sponges are assigned the following position:—*Metazoa*. Type A, *Phytozoa*: 1st series, *Spongiæ*. They are divided into Embranchement A, *Calcareous Sponges*; Embr. B, *Siliceous Sponges* (*Hexactinellida*, *Hexacertina*, *Chondrospongiæ*, and *Cornacuspungiæ*).

- PIATNITZKY, P. P. Comptes rendus des recherches géologiques. III. Recherches des dépôts Crétacés des bassins du Don et des affluents gauches du Dnieper. Trudui Kharkoff Univ. xxiv, 1890 (1891), pp. 1-183. [pp. 20, 26, 32, & 33, *infra*.]
- PILLET, M. Fossiles du Valangien Moyen de la Chambotte (Calcaire Roux). Bull. Soc. Savoie iv (1890) 2, (April, May, and June), pp. 57-62. [pp. 20, 22, & 27, *infra*.]
- POČTA, P. Ueber einige Spongien aus dem Cuvieri-Pläner von Paderborn. Z. geol. Ges. xlii, 1890, pp. 217-232, taf. vi-viii.
- RAUFF, H. (1) Vorläufige Mittheilung über das Skelet der *Anomocladinen*, sowie über eine eigenthümliche Gruppe fossiler Kalkschwämme (*Polysteganiinae*), die nach dem Syconen-Typus gebaut sind. JB. Mineral. 1891, i, pp. 278-284.
- . (2) Ueber *Palæospongia prisca*, Bornem., *Eophyton*, z. Th., *Chondrites antiquus*, *Haliserites*, z. Th., und ähnliche Gebilde. *Op. cit.* 1891, ii, pp. 92-104.
- ROCHEBRUNE, A. F. Les Spongiaires; in Brehm, Merveilles de la Nature. Edition Française, Paris, pp. 647-674, figs. 1032-1095.
- TOPSENT, E. (1) Voyage de la Goelette 'Melita' aux Canaries et au Senegal. Spongiaires. Mém. Soc. Zool. 1891, iv, pp. 11-15, pl. ii.
- . (2) Spongiaires des côtes Océaniques de France. Bull. Soc. Z. Fr. 1891, xvi, pp. 125-129.
- . (3) Éponges de la Mer Rouge. Mém. Soc. Zool. v, pp. 21-29, pl. i.
- . (4) Essai sur la Faune des Spongiaires de Roscoff. Arch. Z. expér. (2) ix (1891), No. 4, pp. 523-554, pl. xxii, figs. 1-8.  
Gives a complete list of the Sponge fauna of Roscoff.
- . (5) Deuxième Contribution à l'Étude des Clionides. *T. c.* pp. 555-592; pl. xxii, figs. 9-17.
- . (6) Additions à la faune des Spongiaires de Luc. Bull. Soc. L. Norm. (4) iii (1890), pp. 53-60.
- VÆLTZKOW, A. Vorläufiger Bericht über die Ergebnisse einer Untersuchung der Süßwasserfauna Madagascars (Schluss). Zool. Anz. xiv, No. 367 (13th July, 1891), pp. 221-230.  
Occurrence of an undetermined freshwater Sponge, p. 225.
- WALCOTT, C. D. The Fauna of the Lower Cambrian or Olenellus Zone. Rep. U. S. Geol. Surv. 1888-89, pt. i, pp. 515-629, pls. xlix-xcviii.  
Sponges, pp. 587 & 597. [pp. 20, 25, & 26, *infra*.]
- WEBER, M. (1) *Spongillidae* des indischen Archipels. Zoologische Ergebnisse einer Reise in Niederländisch Ost-Indien, herausgegeben von Max Weber (Leyden), i, 1890, pp. 30-47, taf. iv.

[WEBER, M.] (2) & WEBER-VAN BOSSE, A. Quelques nouveaux cas des Symbiose. *T. c.* pp. 48-72, pl. v.

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A complete account of freshwater Sponges.

WHITEAVES, J. F. Contributions to Canadian Palæontology. Vol. i, pt. iii. 5. The Fossils of the Devonian Rocks of the Mackenzie River Basin. Geol. and Nat. Hist. Survey of Canada (Montreal: 1891) pp. 197-253, pls. xxvii-xxxii [pp. 20 & 25, *infra*].

WILSON, H. V. Notes on the Development of some Sponges. *J. Morph.* v, No. 3 (Dec. 1891), pp. 511-519, 3 woodcuts.

WISNIOWSKI, T. Mikrofauna aus den Ornaten-Thonen der Umgegend von Krakau, ii Theil, Die Spongien des Oberen Callovien in Grojec. Bulletin international de l'Académie des Sciences de Cracovie, Nov., 1890, pp. 260-264.

Remains of *Lyssakina*, *Monactinellida*, and *Tetractinellida*.

WOOD-MASON, J., & ALCOCK, A. Natural History Notes from H.M. Indian Marine Survey Steamer 'Investigator,' Commander R. F. Hoskyns, R.N., commanding. No. 21. *Ann. N. H.* (6) vii, pp. 1-19, 186-202, & 258-273.

8 Sponges obtained, 7 *Hexactinellids*, and 1 *Monaxonid*, p. 9.

— & —. (2) Natural History Notes from H.M. Indian Marine Survey Steamer 'Investigator,' Commander R. F. Hoskyns, R.N., commanding. Series ii, No. 1. On the Results of Deep Sea Dredging during the Season 1890-91. *Op. cit.* viii, pp. 16-34, 119-138, 268-288, 353-362, & 427-452, pls. vii, viii, & xvii.

*Porifera*, p. 451. Several *Hexactinellids* from the Andaman Sea and Bay of Bengal.

## II.—ANATOMY, EMBRYOLOGY, PHYSIOLOGY, BIOLOGY.

### A. ANATOMY, HISTOLOGY, MORPHOLOGY, AND PHYLOGENY.

According to BIDDER, the supposed pseudoscula of *Ascartis cerebrum* are true oscula. A many-layered endoderm occurs in *Ascartia clathrus*. The typical ectoderm of Sponges is composed of onion-shaped gland-cells, containing a nucleus and granules, and provided with a usually fine duct with expanded ends. Almost the whole ectoderm in *Ascartia clathrus* and *blanca*, and a great part of it in *Ascartis cerebrum*, &c., is of this type, which the author thinks may prove the primitive Metazoan ectoderm. Cilia do not exist on the ectoderm cells. The sheath of the apical ray of gastral spicules is of endodermic origin.

The pores arise from metamorphosed collar cells, for which the name "Metschnikoff's cells" is proposed, and which reach to the exterior and become perforated. The granules in the Metschnikoff's cells and in the ectoderm are excretory. The nucleus of the ovum of *Ascetta clathrus* contains a typical reticulum, with small granules at the nodes. The rod-like bodies observed on the gastral surface of Sollas's membrane in *L. tripodifera* are probably of vegetable origin. [See DENDY (4).]

DENDY (1) describes the anatomy of *Grantia labyrinthica*. The osculum becomes enormously wide during growth of the Sponge, so that the adult form consists essentially of a thin walled cup or basin. The wall of the cup, which in the young Sponge is simple, becomes convoluted and folded on itself. The cup is attached by a cylindrical stalk, not present in the very young Sponge. The inner surface of the cup has a minutely punctate appearance, owing to the openings of the flagellated chambers. The outer surface bears the pore sieves. The spicules are triradiate, quadriradiate, and uniaxial. A dermal skeleton forms a distinct cortex on the outer surface of the Sponge, and a gastral skeleton forms a similar cortex on the inner side. The skeleton of the peristome forms an oscular fringe. The tubar skeleton is articulate. The stalk has a skeleton composed of a confused mass of closely interwoven sagittal triradiates. The pores are arranged in sieves lying between the ends of the flagellated chambers. In the pore areas the cortex is reduced to a thin membrane. The inhalant canals commence as widely expanded cavities under the pore sieves. They branch and anastomose, and rapidly diminish in diameter as they penetrate between the flagellated chambers, ending just below the gastral cortex. The prosopyles are regularly scattered over the chambers. The flattened epithelium of the inhalant canal meets the lining of collared cells of the chamber round the aperture of the prosopyle. The flagellated chambers have the usual Sycon character. At their peripheral ends they exhibit a marked inclination to branching. Structures are often met with in sections, which suggest that the chambers die, like individuals, and are probably replaced by new chambers. The exhalant canals are short, wide, cylindrical tubes, placing the chambers in communication with the gastral cavity through the cortex. They are marked off by sphincter diaphragms from the chambers. The ectoderm consists of a single layer of flat polygonal epithelial cells, with a nucleus surrounded by granules. The endoderm consists of flattened cells lining the gastral cavity and exhalant canals, and of collared cells in the chambers. The author maintains the existence of Sollas's membrane, which von Lendenfeld had tried to deny. In the present Sponge the collars and flagella were found retracted, which is probably a periodically recurring phase in the life-history of the cells. The collared cells are narrowed towards the upper end, which contains the nucleus. The apices are connected by a fine sharp line in section, which is Sollas's membrane, visible even when the collars are retracted. The mesoderm contains (1) amœboid

cells; (2) stellate cells; (3) glandular cells, of two kinds, one secreting spicules, and the other occurring in a single layer, just beneath the epithelium of the Sponge, secreting slime or a cuticle; (4) endothelial cells lining the embryo-containing cavities; (5) muscular cells; (6) cells, probably nervous, occurring round the margins of the pores; and (7) reproductive cells. The ova hang from the epithelial lining of the inhalant canals by means of short peduncles, and project freely into the lumen of the canal, awaiting fertilization. After fertilization, the ovum probably migrates back into the ground substance, and develops near the wall of a flagellated chamber. The young Sponge differs but little from an ordinary *Grantia*. A case of budding was observed, in which the bud had the typical Sycon form.

According to DENDY (2) the inhalant pores of *Halichondria panicea* lead into a system of irregular lacunæ, which penetrate inwards and become smaller and smaller. The ectosome is thin. The exhalant lacunæ interdigitate with the inhalant ones, and are separated from them only by their strands of tissue, in which lie the chambers and spicules. The exhalant lacunæ usually unite into oscular tubes. The chambers are subspherical, with a very wide exhalant opening. The collared cells stand a little distance apart from one another. The collars are connected by a very distinct Sollas's membrane. Since the collared cells nearest the opening are shorter than those far away from it, the membrane approaches closer and closer to the ground substance, and finally seems to run into it at the opening. The collared cells have distinct flagella, coexisting with the membrane, and are connected with one another by protoplasmic strands at the base. There appears to be no opening in the Sollas's membrane at the prosopyles, and it probably serves for filtering food-particles from the water. In Sponges with large prosopyles, e.g., *Sycons*, it probably does not stretch across the prosopyle, but ceases at the margin.

The ova in *Halichondria panicea* are suspended by a peduncle from the walls of lacunæ, probably inhalant. The ovum is coarsely granular. The nucleus has a very thick membrane, and is finely granular, with a single spherical nucleolus, excentrically placed.

DENDY (4) describes the Organization of the *Olythus* type, and the Histology and Canal System of the *Calcarea homocela*. The ectoderm consists of a flattened, non-ciliated epithelium. The collared cells of the endoderm vary somewhat in different Sponges. In *Leucosolenia proxima* the collars may come into contact at their margins, without forming a distinct Sollas's membrane. In *L. tripodifera* the collars are united by a Sollas's membrane, which is peculiarly modified; its outer surface is thickly studded with delicate rod-like processes of uniform length, and projecting from it into the gastral cavity. The mesoderm consists of ground substance, which is feebly developed and free from granules, and contains—(1) Stellate connective tissue-cells, very abundant. In *Leucosolenia proxima* these cells have grown out between the collared endoderm cells into the gastral cavity, forming a delicate network, pl. viii, fig. 2. (2) Amœboid wandering cells. (3) Perhaps subdermal gland cells. (4)

Endothelial cells, lining embryo-containing cavities and the spicule rays which project into the gastral cavity ; in the latter case the cells may be endodermal. (5) Reproductive cells : the ova arise from (2) ; they are oval in form, with distinct nuclei, and round them are congregated (in the young ova of *L. cavata*) a number of mesodermal cells, which are probably the commencement of the characteristic capsule. The nucleus (in *L. pelliculata*) has one very large spherical nucleolus and a distinct membrane. In *L. depressa* there is an irregular row of spherical granules just inside the nuclear membrane, which resemble the granules of the protoplasm outside.

In *L. cavata* a number of yellow granules, arranged in clusters, each with a dark spot (nucleus?) in the centre, lie embedded in large numbers at fairly regular intervals in the mesoderm beneath the collared cells. It is doubtful if they belong to the Sponge body, or are symbiotic algæ.

The skeleton consists of triradiate, quadriradiate, and oxeote spicules.

The canal system serves for division of the genus *Leucosolenia* into three sections:—I. *Simplicia*, including Olynthus types, which never form colonies, and also colonial forms, in which the whole colony consists of individuals (Ascon persons) which may branch, but which never form complex anastomoses nor give off radial tubes, so that the individuality of the different members of the colony is always recognizable. II. *Reticulata*, in which the Sponge colony forms a more or less complex network of branching and anastomosing tubes ; and it is no longer possible to distinguish the individual Ascon persons of which the colony is composed. The gastral cavities of the Ascon tubes may retain the primitive hollow condition, there being no ingrowth of the mesoderm or ectoderm (Subsection 1, *Indivisa*), or may be more or less subdivided into incomplete chambers by ingrowths of mesoderm, or of both mesoderm and endoderm (Subsection 2, *Subdivisa*). III. *Radiata*. The Sponge consists of a single central Ascon tube, from which smaller tubes are budded off radially.

The author has observed no species of *Leucosolenia* without an osculum, and thinks that in *Auloplegma* forms the oscula have been overlooked.

Canal system of *Leucosolenia lucasi*, pp. 24 & 25, of *L. stolonifer*, pp. 25 & 26, of *L. dubia*, p. 28, of *L. stipitata*, p. 28, of *L. pulcherrima*, pp. 28 & 29, of *L. cavata* (reversed type of canal system), pp. 29 & 30, of *L. ventricosa*, pp. 30–32, of *L. proxima*, p. 33, of *L. wilsoni*, p. 34, and of *L. tripodifera*, pp. 35–37.

KELLER (1) describes the anatomy of the *Oligoceratina* and *Tetractinellida*. In the skeleton of the *Oligoceratina* spongin is absent in the families *Tethyadæ*, *Chondrosidæ*, and *Plucospongidæ*, but appears in the *Spirastrrellidæ*, allies of the last-named family ; thus *S. decumbens* covers the surface on which it grows with a thin plate of spongin, from which arise vertical spongin lamellæ. In *Suberitidæ* spongin as a rule is wanting, but sometimes present ; in *S. incrustans* there is a network of fibre of stratified structure. In *Renieridæ* spongin is sparing and colour-

less, except in the new genus *Damiria*. In this family appear fibrous tracts of spicules quite imbedded in spongin. Monaxon spicules prevail amongst the *Oligoceratina*, but various kinds of asters also occur. In *Chondrosidæ* the siliceous structures degenerate till they vanish, but in *Placospongida* they are increased both in number and variety. The extreme of skeletal development is the differentiation into a cortical and an axial portion. A cortex appears frequently in *Renierinæ*, and has been inherited from them by the *Chalininæ*. Radially-disposed bundles of spicules often occur, especially in *Tethyadæ*, where they arise from a central nucleus. This arrangement is homologous with the similar one of *Tetractinellida*.

The canal system of the *Oligoceratina* is mostly of the third type. Microscopic dermal pores lead into subdermal spaces. In the thin-walled tubular *Renierinæ* the inhalant canals are distinctly radially arranged. In these forms pronounced lipostomy is the rule. In more modified forms the canal system is of the fourth type. *Placospongia* has immense subdermal spaces. These forms are seldom tubular, an exception being *Suberites mastoideus*, which is tubular, with a wide gastral space, and often in addition a pseudosculum and pseudogaster.

The author concludes that the Oligoceratine *Monactinellidæ* have arisen from Tetractinellid ancestors, probably *Tetillidæ*. From this family arose the *Tethyopsillidæ*, and from them the *Tethyadæ*. From the *Tethyadæ* is given off a branch, the *Chondrosidæ*, in which the spicules degenerate, but the main stem continues from the *Tethyadæ* into the *Spirastrellidæ* and *Suberitidæ*. The *Renieridæ* are probably derived from *Suberitidæ*, and have given rise to the *Chalinidæ*. The *Spongillidæ* are polyphyletic, and arise partly from *Renieridæ*, partly from *Chalinidæ*. Thus from the *Tetillidæ* can be traced a continuous series up to the Horny Sponges, with a continual tendency to degeneration, first of the tetraxon spicules, which become monaxon, and then are gradually replaced by spongin; and, finally, the spongin fibres also degenerate, as in *Hali-sarcidæ*. For description of the anatomy of *Tethya seychellensis*, Soll., see p. 330.

In *Tetractinellida* spongin occurs, though rare. In *Stelletia siemensi* it occurs as numerous spherical or elliptical bodies of an intense brown colour, which are very resistant to acids and alkalis, but slowly dissolve in hot potash. They lie in closed follicles lined by cubical cells. The third type of canal system preponderates in the more delicate forms of *Choristida*, but in massive forms the fourth type prevails. In *Lithistida* the canal system appears to be of the third type. The canal system shows a certain resemblance to that of *Aplysillidæ* and *Hexactinellidæ*. Between the cortex and the region of the chambers is a zone of lacunes without chambers. Nothing was observed of a "Sollas's membrane." For a description of the pores, pore sieves, pore calyces, chones, and subdermal spaces, see p. 334.

In conclusion, the author describes the influence of vertical distribution upon the mechanical construction of the Sponge body. In abyssal

regions, where the pressure does not vary, flexibility is not necessary, but the surface of the Sponge often has to bear a considerable load, since it may become covered by falling masses of mud. In moderate depths the pressure varies sensibly on account of waves. In the littoral zone, which in the warmer seas is the chief home of the *Chalininae* and *Keratosæ*, the skeleton is often subjected to uninterrupted pressure and strain. Among *Hexactinellida*, characteristic deep-sea forms, the body is generally fragile, with little flexibility, but considerable power of bearing loads. They are continually covered by falling mud, which it is obviously the function of the oscular sieve to keep out. Perhaps also it is the task of the commensal crustaceans to clear out this mud. The *Lithistida*, occurring principally from 50–200 faths., resist differences of pressure and strain by a very strong siliceous skeleton. The *Choristida* reach their maximum from 0–50 faths.; amongst them the *Geodiæ* resist lateral strains by their broad bases, and pressure by their strong cortex. Other genera (*Tetilla*, *Tethya*, &c.) protect themselves by a strong "Turgor" of the tissues, so considerable, that if a *Tethya*, for example, be cut, the surface of the incision bulges out. The *Monactinellidæ* and Horny Sponges, numerous in shallow water, are subject to much pressure and strain, to resist which silica is not elastic enough; hence, as a new skeletal material, spongin appears, first as a cement to fasten spicules together, and then as strong fibres chiefly running longitudinally in the direction of the greatest strain. The tension which the tissues have to withstand being greater at the periphery than in the interior, the tissues with their supporting structures tend to be placed peripherally, and as a compromise between the necessity of nutrition and of support, arise the frequent tubular, funnel-shaped, or cup-like forms. Thus many morphological peculiarities of the Sponge body can be explained on mechanical principles. There is no doubt that the Sponges with spongin arose cænogenetically from siliceous Sponges without spongin as the result of life in shallow water. The mechanical cause which led to the formation and subsequent further development of the *Monactinellidæ* and Horny Sponges was the agitated water with its resulting tensions. These conclusions are apparently contradicted by the Horny Sponges, e. g., *Psammophyllum* and *Stannophyllum*, described by Hæckel from great depth, but these genera appear to be nearest related to certain littoral forms, and hence may be descended from littoral ancestors. The formation of an oscular sphincter may heighten the turgor of the Sponge body, and the chones of *Stellettidæ* perhaps have a similar function.

KELLER (2), after a short historical introduction, discusses the distribution of spongin, the structure of spongin secretions, the influence of life habits on the construction of the skeleton of Sponges, and the dependence of spongin formations upon vertical distribution. Spongin occurs in the three great orders of the *Keratosæ*, the *Monactinellida*, and *Tetractinellida*. It is quite wanting in *Hexactinellida* and in existing *Calcarea*, though amongst fossil forms the *Pharetrones* seem to have had their spicules cemented together with spongin. [Cf. RAUFF (1) on this



point.] To the four categories of spongin fibres distinguished by Kölliker, should be added a new form of fibre, with fibrillar structure (*Acarnus*). In *Psammophysilla arabica* the cortical sheath is wanting, and the whole fibre consists of medulla, showing distinct stratification. In *Spirastrella decumbens* there is a basal plate formed of a thin lamella of spongin. In *Stelletta siemensi* there are spongin spheres. The organization of Sponges is as favourable a compromise as possible between the principles of nutrition and firmness. In *Euplectella* the power of bearing loads (*i.e.*, particles falling from above) is increased by the longitudinal tracts of spicules, held together by circular ribs. In addition, there are two systems of ribs, running spirally and crossing at a right angle. Their direction corresponds exactly to the curves of pressure and pull upon a hollow cylinder, which is fixed at one end and free at the other, when acted upon laterally by a force directed perpendicularly to the long axis of the cylinder. In *Euplectella suberea* the curves of pressure and pull are exceedingly regular, and the Sponge is fitted to resist pressure in all horizontal directions. In *Euplectella aspergillum* the curves often run irregularly in the upper part of the Sponge, but in some specimens are quite regular. In the former case the cornucopia-shaped Sponge has only feebly projecting spiral curves on the convex side, but strong ones on the lateral parts. This shows that the pressure caused by horizontal water currents works from one side, and is directed against the convex side. For the author's views on the effect of vertical distribution upon spongin structures, see KELLER (1).

VON LENDENFELD (1) details many facts in the anatomy and histology of the Calcareous Sponges. *Ascetta clathrus* is described under four forms, A (pp. 211 & 212), B (pp. 212 & 213), C (pp. 213 & 214), and D (pp. 214 & 215), which appear to succeed one another in postembryonal development, and are therefore not to be regarded (with Hæckel) as distinct varieties. In the forms B, C, and D the endoderm is many layered. The author believes that from the larva is produced Form A, which produces by budding Form B, in which the sexual cells ripen. During this process the Sponge loses its pores and passes into Form C, and finally into Form D. The latter form represents a resting condition of the Sponge, and during its growth the embryos ripen and leave the Sponge. All forms are without oscula, as were also all the specimens observed of *Ascetta cerebrum* (p. 208), *A. blanca* (p. 218), and *Ascandra reticulum* (p. 223), and many specimens of other Ascons. In *Homandra falcata* (= *Ascandra falcata*, H.) a peculiar kind of canal system is described (pp. 230 & 231). Small pores on the surface lead into narrow canals. These unite into larger, irregular, short stems, which open into a subgastral system of lacunes. Numerous pores put these lacunes into connection with the gastral cavity. In younger examples pores on the surface lead directly into the gastral cavity. In *Sycantha tenella* (p. 236), the flagellated chambers, which are long and narrow, do not all communicate directly with the gastral cavity, but are united in groups, and the water goes from one chamber to another before reaching the gastral

cavity. *Vosmaeria corticata* (pp. 298 & 299) has a peculiar canal system, resembling greatly that of *Hexactinellida*. For the canal system of *Calcarea* in general, see pp. 376-382. Epithelium of *Calcarea* (p. 394). In *Asconida*, *Leucopsida*, and *Leuconida*, the entire flattened epithelium, in all the canals as well as on the outer surface, is of ectodermal nature, while the endoderm is represented by the collar cells in the Ascon tubes, and in the chambers of *Leucopsida* and *Leuconida*. In *Homodermida*, *Syconida*, and *Sylleibida*, the external surface and the inhalant canals are clothed by ectoderm, the chambers, excurrent canals, and oscular tube with endoderm. The collar cells (p. 396) are connected by processes with one another, or send out fine threads which anastomose between the cells. In *Ascetta primordialis* (pp. 200 & 201) the collar cells do not touch one another, but are separated by clear spaces containing an intervening substance similar to the ground substance of the mesoderm. This intervening substance forms a network of trabeculæ of varying thickness. The larger trabeculæ contain an axial protoplasmic thread. In the nodes of the network these threads anastomose and usually form at these points distinct thickenings. Between the collar cells are often multipolar protoplasmic masses, containing one or more nuclei, according to size. All transitions occur from the largest multinuclear structures of this kind to the small thickenings of the protoplasmic threads at the nodes of the intercellular network. Sometimes two collar cells are connected with one another by a broad bridge of protoplasm. More often they send off fine threads, which can be followed to some distance. Most collar cells, and all the multipolar elements, whether large and multinuclear or small and nonnucleated, are united with this network of threads, which is probably the result of multiplication of the collar cells by division. The large nucleated multipolar cells are to be looked upon as "mother collar cells" (Kragenmutterzellen). They occur only in growing parts of the Sponge, producing collar cells which multiply further by division. The small non-nucleated lumps of protoplasm at the nodes of the network of threads are the final indifferent remains of the "mother collar cells." A collar cell layer of similar structure occurs in *Ascetta spinosa* (p. 205), *A. cerebrum* (208), *A. clathrus* (211), *A. blanca* (p. 218), *A. gæthei* (p. 221), *Ascandra reticulum* (p. 224), *A. angulata* (p. 227), *Homandra falcata* (p. 231), and *Vosmaeria corticata* (p. 299). In *Sycandra raphanus* (pp. 253 & 254) the collar cells are separated by intervening substances, but multipolar masses of protoplasm between the cells were not to be found. The collar cells send down processes into the mesoderm. Near the edge of the osculum occur pear-shaped cells, usually united in groups, with their thick ends in contact. The other end runs out into a long process. These groups of cells are the rudiments of flagellated chambers, and the pear-shaped cells become transformed into collar cells. The collar cell layer is similar in *Sycandra tuba* (p. 245), *S. setosa* (p. 259), and *Amphoriscus cylindrus* (p. 286). In *Ascetta spinosa* (p. 205), granular, brownish cells occur in the collar cell layer, which are probably parasites of symbiotic vegetable organisms.

The flattened epithelium of *Calcarea* (p. 398) perhaps has flagella, but not more than one to each cell. For the mesoderm the term "intermediate layer" (Zwischenschicht) is proposed (p. 398). It contains: (1) amoeboid cells (p. 399), which function as phagocytes and are also the mother cells of the ova and spermatozoa; (2) stellate and fibrous cells (pp. 400 & 401; in *Ascetta primordialis*, p. 198, *A. clathrus*, p. 211, *Sycandra raphanus*, pp. 252 & 253, *S. setosa*, p. 259). The deeper lying cells have numerous processes, which become more tangentially directed the nearer they approach the surface, at the same time decreasing in number, until immediately under the epithelium they become bipolar fibre cells, which form sphincters; in the gastral membrane of *Sycandra setosa* they are numerous. All these cells and their processes are contractile, and bring about the closure of the pores and oscula. (3) Sense cells (p. 402). Some spindle-shaped, with several root-like processes at the inner end, others multipolar, with a centrifugally directed process, others rounded or multipolar without differentiated processes. For a probably nervous "syncoil" like structure in *Sycandra raphanus*, see p. 251. For strongly staining cells of irregularly rounded shape, probably nervous, situated near the pores, in *Grantia capillosa*, see p. 278. (4) Skeleton forming cells (p. 403). The spicules arise in irregularly shaped cells. In *Ascetta primordialis* (p. 199) the author finds, in contradiction to Metschnikoff, that the young spicule forming cells are clear, and more or less free from granules. The growing spicule becomes surrounded by granular flattened cells with processes, placed singly or in groups. These cells, however, are rarely to be found on the spicule, and appear to vanish as soon as the spicule has attained its full growth. (5) Gland cells. Multipolar elements which are probably such, occur under the epithelium of the oscular crown in *Sycandra raphanus*. (6) Ova (p. 404). For description of ova, with what appeared to be polar bodies, in *Ascetta primordialis*, see p. 209. Ova in *Sycandra raphanus*, p. 255; in *S. setosa*, p. 259; in *Vosmaeria corticata*, p. 299. (7) Sperma (p. 404).

The author considers that there is no essential difference between triactine and tetractine spicules, and hence unites such of Hæckel's genera as are only distinguished by the possession of these two kinds of spicules. It is doubtful if the triactines are the most primitive kind of spicule, since many simple Ascons have only rhabds. The origin of rhabds is very doubtful; either they have arisen independently, or from triactines, or from tetractines. Perhaps they have arisen in different ways in different Sponges.

Sponges are to be looked upon as a phylum of *Metazoa* belonging to the grade *Cœlentera*, but not on that account phylogenetically related to *Cnidaria*. They are *Cœlentera* traversed by a canal system, with endodermal collar cells and with their skeletal, sexual, and muscular cells formed in the "Zwischenschicht" and not of epithelial origin, without nettle-cells and moveable appendages. In Sponges an "individual" can have any number of oscula. No scientific conception of individuality

can be practically applied to *Calcarea*. Each Sponge is to be looked upon as an individual, whether it be a "person" or a "stock."

For the phylogenetic relations of the families, subfamilies, and genera of *Calcarea*, with diagrams, see pp. 420-423. For a new nomenclature of the rays of the tetractine spicules, see p. 187.

VON LENDENFELD (2) describes the arrangement of the siliceous spicules in the species of *Geodia* occurring in the Adriatic, and finds in it a new proof of the correctness of F. E. Schulze's theory of the origin of the different forms of spicules.

RAUFF (1) describes (I) the skeleton of the *Anomocladina*, and (II) a Sycon-like group of fossil *Calcarea*, which he terms *Polysteganinae* :—

I. The fundamental form of the Anomoclad skeleton is the tetraxon. It is nearest related to the tetractad spicule, being a regular 4-rayed element, with one arm shortened and differentiated in form. The author terms this arm the "Knoten" (knob); it is usually thickened or swollen. The skeletal elements are united in such a way that the ends of the normal arms are applied to the "Knoten" of neighbouring spicules. All spicules are so placed in the Sponge body that the "Knoten" are directed centrifugally outwards. Two groups can be distinguished by the position of the spicules. In the first group (e.g., *Astylospongia*) all the spicules have (theoretically) one and the same position, so that their corresponding limbs are parallel to one another, and similarly orientated. As a result, in each "Knoten" four spicules fuse with one another, namely the one to which the "Knoten" belongs, and three others, and the meshes of the skeleton are similar and contiguous rhombohedra. But a complication is always introduced by the fact that the normal, primary, or principal arms, as they may be termed, send out secondary arms, which resemble the primary ones. The points of bifurcation generally lie close to the "Knoten." The secondary arms attach themselves to neighbouring "Knoten," and the three include between them an angle of 90°. In the second group (e.g., *Hindia*) secondary arms are wanting, and the spicules have not all the same position, but usually two kinds of positions, in which neighbouring spicules alternate. The one position arises from the other by revolution of the spicule through 60° round the axis of the "Knoten." Then the "Knoten" lie in the edges, and the arms in the surfaces, of hexagonal tubes. In tetractads also a definite plan of structure could be determined, but not universally demonstrated. The tetraxons, touching one another with the ends of their four equally-developed arms, take such a position as to enclose regular rhombic dodecahedra, the edges of which are formed by the arms, the middle points of the spicules lying in the trigonal corners.

II. Fossil *Calcarea* do not differ in any essential way from recent forms. The fundamental skeletal element for all *Calcarea*, Triassic forms included, is the triradiate spicule. The so-called Pharetron-fibre is a secondary phenomenon, due to fossilization, and the spicules were not originally united by spongin or other cementing material. The *Polysteganinae* are a new group of Sycons, only differing from recent Sycons by a peculiar

mode of colony formation, and probably go back to the Carboniferous. The spherical or compressed barrel-shaped individuals are arranged one on the other, like a string of pearls, so that elongated upright stems arise, characterized externally by constrictions, corresponding to which the internal thin-walled cavity of the whole stem is divided by partitions into segments or chambers, lying one over the other. By lateral budding larger colonies of the second order are formed. Between the stems, or colonies of the first order, remain systems of spaces, which are partly hollow, partly filled with tissue, composed of anastomosing fibres. The so-called partitions are the arched-in lateral walls of the individuals; each has a terminal cover, which for a time formed the upper termination of the stem, till a new chamber was formed over it. The partitions have large central openings, which have functioned as oscula, one after the other. The edges of these openings are turned upwards or downwards, or both ways, and the collars thus formed grow from one to the other partition, so as to form an axial tube traversing the whole stem, a true oscular canal, which is in communication by fenestræ, arranged in whorl, with the ring-shaped chambers or paragasters of the single segments. Both partitions and lateral walls are perforated by numerous fine radial simple canals, the radial tubes or chambers.

A type of the group is *Barroisia*, (*Verticillites*, *Tremacystia*) *anastomosans*, &c., and *Thalamopora cribrosa*, Goldf. In *Barroisia*, the skeleton consists mainly of triradiates without order, as in the recent *Anamixilla*. No gastral skeleton was observed, but there was a distinct dermal skeleton formed of fine pin-shaped spicules, with the heads directed outwards. They are arranged in bunches of a hollow tubular shape, forming the continuation of the skeleton of a radial tube, the outer extremity of which they leave uncovered. The cap forming the extremity of the stem consists, like the wall, of an inner layer of triradiates, and an outer one of pin-shaped spicules. But when a new segment is formed, and the cap becomes a partition, it becomes three-layered, since the gastrally-placed skeletal part of the lateral wall of the new segment grows over, and covers the floor of the segment. The oscular tube is formed only of triradiates, without "pins." Also the intermediate tissue formed of anastomosing fibres appears to consist solely of triradiates. Thus the *Polysteganine* have the same structure as modern Sycons, and, since both in the former and the latter spongin is certainly absent, it may be inferred that it is absent in other Pharetrones also.

For the Anatomy and Histology of *Spongillida*, see WELTNER.

## B. EMBRYOLOGY AND ASEXUAL DEVELOPMENT.

DELAGE (1, 2) finds that in the larva of *Spongilla* there is, under the ciliated cells, a discontinuous layer of large rounded cells, which travel to the exterior, and become the ectoderm after fixation. The difference between *Spongilla* and *Esperella* is that in the former the true ectoderm is entirely internal. The central nucleus of the larva is formed of large

rounded cells. When the larva is fixed the ciliated cells lose their cilia, and occupy a peripheral zone under the ectoderm. The large rounded cells in the interior now become amœboid, and, sending out pseudopodia, capture the former ciliated cells one by one. Each cell, when captured, is incorporated. When the capture is complete, the larva appears spread out and filled with the large cells, which are now perfectly round, and show round their own nucleus a number of little nuclei, which Maas and Götte took for vitelline granules. After 24 to 36 hours the captured cells become active, travel to the periphery of the large cell, and emerge from it. Some form the lining of canals, others become grouped in little hollow masses, acquire collars and flagella, and become ciliated chambers. The pores and oscula are distinct from their origin. In *Aplysilla* the formation of the ectoderm and chambers is similar to that in *Spongilla*.

The capture of the ciliated cells is a phenomenon of phagocytosis, which is incomplete in that it is temporary, though a certain number appear to be really digested. It resembles the histolysis of insects, with the difference that here the elements incorporated by the phagocytes are utilized in the subsequent histogeny directly, and not as simple nutritive matter.

For descriptions and figures of the larva of *Esperella sordida*, Bwk., see HANITSCH, pp. 215 & 216, pl. xi, figs. 8 & 9.

WILSON describes the gemmule development of *Esperella fibrexilis*, n. sp., and *Tedania brucei*, n. sp., to which are added observations on the egg development of *Tedanione fetida* and *Hircinia acuta*. The mesoderm of *Esperella* contains certain cells, distinguished by their size, which congregate into groups, forming gemmules. The outermost cell layer of the gemmule becomes flattened, forming a follicle. The gemmules increase in size by cell growth and division, and by fission of neighbouring small gemmules. It is possible that some gemmules originate from single cells. The ripe gemmule is made up of closely-packed cells, filled with yolk granules, with indistinct cell boundaries. It lies in one of the larger canals, suspended by threads of tissue, binding the follicle to the canal wall. It next goes through a process analogous to segmentation, by which the solid gemmule is split up into smaller and smaller masses of cells, and finally into its constituent cells. The outermost layer forms a flattened ectoderm, enclosing amœboid cells, connected by processes and separated by fluid. The ectoderm next becomes columnar and ciliated, except at one pole, where it remains flat. The inner cells at this pole become closely appressed, forming a mass of polygonal cells, in which spicules are formed. In this condition the embryo swims out free from an osculum. Before fixing the ectoderm begins to flatten, from the non-ciliated spicular pole backwards. While there is still a remnant of ciliated epithelium, the larva fixes by the spicular pole, but obliquely, and becomes a thin flat mass. The subdermal cavities and the canals appear as lacunæ, which open into one another, and to the exterior by perforation of the intermediate tissue. Pores and oscula are at first

indistinguishable. The flagellated chambers arise independently, and subsequently acquire connection with the canal system. They originate from mesoderm cells, marked out in the larva by their size, "formative cells," which behave differently in different larvæ, but a single formative cell never itself forms a chamber. At its first origin a chamber is an intercellular lacune.

The author points out the resemblance between this asexual development and the egg development of many siliceous Sponges. By the light of Weissmann's theory he would regard the gemmule-cell as a true germ-cell, in which none of the germ plasm is transformed into ovogenetic plasm, and which pursues the parthenogenetic course of development.

The gemmule development of *Tedania* is quite similar to that of *Esperella*.

The egg of *Tedanione* has a total segmentation, resulting in a solid morula, and the free larva is a solid oval body, completely covered with columnar ciliated cells. *Hircinia* also forms a morula. The maturation of the egg in these two Sponges (p. 518) is similar to that described by Fiedler in *Spongilla*.

### C. PHYSIOLOGY AND BIOLOGY.

JENNINGS discusses the manner of growth and habits of the Boring Sponge, *Alectona millari* (Carter).

KELLER (1, 2) describes the influence of life conditions upon the secretion of spongin, and its employment to build up the skeleton. [See under "Anatomy, Histology, &c."]

WEBER (2) describes three cases of symbiosis in Sponges: (1) between *Ephydatia fluviatilis* and an Alga, *Trentepohlia spongophila*; (2) between a *Halichondria* and an Alga, *Struvea delicatula*; and (3) between a *Reniera* and an Alga, *Marchesettia spongioides*.

For the Physiology of *Spongillidæ*, see WELTNER.

## III.—DISTRIBUTION.

### A.—FAUNISTIC.

Canada and Newfoundland (*Spongillidæ*); MACKAY.

W. Coast of Ireland; HANITSCH.

Oceanic Coasts of France; TOPSENT (2).

Luc, Sponge fauna; *id.* (6).

Roscoff, Sponge fauna; *id.* (4).

Bergen, Sponge fauna; BRUNCHORST.

Canaries and Senegal; TOPSENT (1).

Adriatic (*Calcarea*); VON LENDENFELD (1, 4).

Red Sea; KELLER, (1) pp. 349-356. *Chalinidæ* predominate. No *Clathriæ* or *Esperiæ* occur, also no species of *Geodia*. The *Calcarea* are feebly represented, and there are no *Hexactinellida*. The only species

common both to the Red Sea and the East African Sea region are either cosmopolitan or spread over the whole Indian Ocean. The Red Sea fauna is more related to the Australian than to the Indian marine regions, perhaps only because the former is better investigated. Only cosmopolitan forms are common to the Red Sea and Mediterranean. The Suez Canal does not appear to alter the conditions quickly. Two species are evidently in the act of migrating, and have each reached the middle of the canal; but now their migration appears to have come to a stop.

Red Sea; TOPSENT (3).

Madagascar (*Spongillidæ*); VOLTZKOW.

Indian Ocean and Bay of Bengal; WOOD-MASON & ALCOCK (1, 2).

Indian Archipelago (*Spongillidæ*); WEBER.

Victoria (*Homocela*); DENDY (4). Mostly from near Port Phillip Heads.

#### B.—GEOLOGICAL.

Laurentian of St. John, New Brunswick (2 Sponges); MATTHEW (2).

Lower Cambrian (*Olenellus* Zone); WALCOTT.

Cambrian of Sardinia (*Palæospongia prisca*); BORNEMANN.

Cambrian of Acadia; MATTHEWS (1).

Ordovician, Ottawa (a new Sponge); HINDE (1).

Siluro-Cambrian of Little Metis, Lower St. Lawrence; DAWSON.

Cincinnati Group, Cincinnati and Kentucky; JAMES.

Devonian of Bohemia; KATZER.

Devonian of Mackenzie River Basin (1 Sponge, *Astræospongia hamiltonensis*, Meek & Worthen); WHITEAVES.

Upper Callovian, Grojec; WISNIOWSKI.

Jura and Cretaceous of Mexico (1 Sponge); FELIX.

Valangian of Chambotte (2 Sponges); PILLET.

Cretaceous of Upper Bavaria; BÖHM.

Pyropen Sands of the Teplitz and Priesen Layers; JAHN.

Cretaceous of the basins of the Don and the left affluents of the Dnieper; PIATNITZKY.

Cuvieri-Pläner of Paderborn; POCTA.

Cherty Siliceous Rock, S. Australia (indetermined Sponge spicules); HINDE (2).

### IV.—SYSTEMATIC AND CLASSIFICATORY.

#### 1. CALCAREA.

VON LENDENFELD (1, 3) gives the following classification of the *Calcarea*:—

Order *Homocela*.

Family 1. *Asconidæ* (pp. 193 & 425).

Genera *Ascetta*, *Ascandra*, *Ascyssa*.



Family 2. *Homodermidæ* (pp. 228 & 426).

(1) Subfamily *Homoderretinæ* (pp. 228 & 426).

Genera *Hometta*, *Homandra*.

(2) Subfamily *Homoderminæ* (p. 427).

Genus *Homoderma*.

Family 3. *Leucopsidæ* (p. 427).

Genus *Leucopsis*.

Order *Heterocæla*.

Family 4. *Syconidæ* (pp. 233 & 427).

(1) Subfamily *Sycanthinæ* (pp. 234 & 428).

Genus *Sycantha*.

(2) Subfamily *Syconinæ* (pp. 238 & 428).

Genera *Sycetta* and *Sycandra*.

(3) Subfamily *Uteinæ* (pp. 276 & 429).

Genera *Grantia*, *Grantessa*, and *Ute*.

(4) Subfamily *Amphoriscinæ* (pp. 284 & 430).

Genera *Amphoriscus*, *Ebnerella*, and *Sycyssa*.

Family 5. *Sylleibidæ* (pp. 294 & 431).

Genera *Polejna* and *Vosmaeria*.

Family 6. *Leuconidæ* (pp. 300 & 432).

Genera *Leucetta*, *Leucandra*, and *Leucyssa*.

DENDY (4) gives the following classification of the *Homocæla* of Victoria :—

*Calcarea Homocæla*, Calcareous Sponges, in which the endoderm consists throughout of collared cells.

Genus *Leucosolenia* (Bwk.), with the characters of the order.

Section I. *Simplicia* (vide sub "Anatomy, Histology, &c.")

*Leucosolenia dubia*, n. sp., *L. stolonifer*, n. sp., *L. asconoides*, Carter, sp.

Section II. *Reticulata* (vide sub "Anatomy, Histology, &c.")

Subsection 1. *Indivisa* (vide sub "Anatomy, Histology, &c.")

*Leucosolenia dubia*, n. sp., *L. stipitata*, n. sp., *L. pulcherrima*, n. sp., *L. pelliculata*, n. sp., *L. cavata*, Carter, *L. protogenes*, H., *L. ventricosa*, Carter.

Subsection 2. *Subdivisa* (vide sub "Anatomy, Histology, &c.")

*Leucosolenia proxima*, n. sp., *L. wilsoni*, n. sp., *L. depressa*, n. sp.

Section III. *Radiata* (vide sub "Anatomy, Histology, &c.")

*Leucosolenia tripodifera*, Carter, sp.

Doubtful species :—*Leucosolenia osculum*, Carter, sp., *L. (?) lamino-clathrata*, Carter, sp., *L. (?) (Homoderma) sycandra*, von Lendenfeld, sp.

*Amphoriscus*, H., definition of genus, p. 285; *A. chrysalis*, O. S., pp. 287 & 288, taf. xi, fig. 69, *cylindrus*, H., VON LENDENFELD, (1) pp. 286 & 287, taf. xi, fig. 75, from Lesina, descriptions. *A. flamma*, Pol., from Canaries; TOPSENT, (1) p. 12, pl. ii, fig. 5. *A. oviparus*, H., from Roscoff; *id.* (4) p. 531.

*Ascallis canariensis*, H., and *A. lamareckii*, H., not to be placed among the radiate *Homocela*; DENDY, (4) p. 38. *A. darwinii*, H., Red Sea; KELLER, (1) p. 348.

*Ascandra*, H., definition of genus, p. 222; *A. lieberkühnii*, O. S., pp. 224–226, taf. viii, fig. 8, *reticulum*, O. S., pp. 223 & 224, taf. viii, figs. 7 & 15, Adriatic, descriptions; VON LENDENFELD (1).

*A. angulata*, n. sp., VON LENDENFELD, (1) pp. 226–228, taf. viii, figs. 9–14, from Rovigno and Lesina.

*Ascetta*, H., definition of genus, p. 194; *A. blanca*, Mik. Maclay, pp. 218–220, taf. viii, fig. 5, *cerebrum*, H., pp. 206–209, taf. viii, fig. 3, taf. ix, figs. 38–44, from Adriatic (Hæckel's two varieties, *gyrosa* and *decipiens*, are to be abolished, since one is only the young form of the other), *clathrus*, O. S., pp. 210–217, taf. viii, fig. 4, taf. ix, figs. 27–37 (Hæckel's four varieties are not to be reckoned as such, since they appear to succeed one another in the course of postembryonal development. The author divides the Sponge into four forms, A, B, C, & D. Form A corresponds to Hæckel's variety *labyrinthus*; Form B to his variety *mæandrina*; Form C has as yet received no name; and Form D corresponds to Hæckel's variety *clathrina* and to *Grantia clathrus*, O. S. Hæckel's variety *mirabilis* is a colony consisting partly of Form D, partly of another form), from Mediterranean and Adriatic, descriptions; VON LENDENFELD (1). *A. coriacea*, var. *osculata*, n. var., HANITSCH, pp. 213 & 214, W. Coast of Ireland. *A. goethei*, H., pp. 220 & 221, taf. viii, figs. 6 & 17–20, *primordialis*, H., pp. 195–203, taf. viii, fig. 1, taf. ix, fig. 23–26 (the name to be retained exclusively for *A. primordialis*, var. *protogenes*, H. Hæckel's four varieties to be raised to the rank of species), from Adriatic, descriptions; VON LENDENFELD (1). *A. primordialis*, H., Auloplegma forms, Reefs of Suakin: KELLER, (1) p. 347.

*A. spinosa*, n. sp., *id.* (1) pp. 203–205, taf. viii, figs. 2, 16, 21, & 22, Adriatic.

†*Ebnerella*, n. g., p. 288, for *Syculmis synapta*, H., (= *Amphoriscus buccichii*, Ebner.), and *E. gregorii*, n. sp., Lesina, pp. 290–292, taf. xi, fig. 66, & taf. xiv, figs. 117–123; VON LENDENFELD (1). *E. buccichii*, Ebner., description; *id.* (1) pp. 289 & 290, taf. xi, fig. 72, Lesina.

†*Elasmostoma acutimargo*, de From., from Middle Valangian of Chambotte; PILLET. †*E.* sp. indet., Cretaceous, N. Bohemia; JAHN, p. 482.

*Grantia*, Fleming: definition of genus, p. 276, *G. capillosa*, O. S., Adriatic description, pp. 277–282, taf. xi, fig. 73, & taf. xiv, figs. 112–116; VON LENDENFELD (1). *G. compressa*, Flem., from Oceanic Coasts of France; TOPSENT (2) p. 128. *G. labyrinthica*, Carter, description; DENDY (1).

† *Homandra*, n. g., p. 228, for *Ascandra fulcata*, H., which is described pp. 229-233, taf. x, figs. 45-51; VON LENDENFELD (1).

† *Hometta*, n. g., VON LENDENFELD, (1) pp. 228 & 426 (without any species).

*Homoderma*, von Lend., probably a *Leucosolenia* belonging to the section *Radiata*, p. 38; *H. sycandra*, von Lend., perhaps belongs to genus *Leucosolenia*, pp. 70 & 71; DENDY (4).

*Homodermida*, von Lend.; see DENDY, (4) p. 38. The species *Ascallis canariensis*, H., and *A. lamarekii*, H., should not be placed in it.

*Leucallia bathybia*, H., Reefs of Suakim and Suez; KELLER, (1) p. 349.

*Leucandra*, H.: definition of genus, p. 305, *L. aspera*, O. S., description, pp. 306-309, taf. xi, fig. 80; VON LENDENFELD (1). *L. nivea*, H., from Luc; TOPSENT (6) [see also under *Leuconia*].

*Leucetta*, H.: definition of genus, p. 302, *L. solida*, O. S., from Lesina, description, pp. 303-305, taf. xi, fig. 76, & taf. xv, figs. 130 & 131; VON LENDENFELD (1). *L. primigenia*, H., Red Sea; KELLER, (1) p. 348.

*Leuconia aspera* (O. S.), Vosm., from Canaries; TOPSENT, (1) p. 11. *L. gossei*, Bwk., *johnstoni*, Carter, from Oceanic Coasts of France; *id.* (2) p. 128.

*Leucopsis*, von Lend., probably a *Leucosolenia* of the section *Reticulata*; DENDY, (4) p. 38.

*Leucortia pulvinar*, H., Red Sea; KELLER, (1) p. 349.

*Leucosolenia asconoides*, Carter sp., *cavata*, Carter sp., pp. 56-58, pl. ii, fig. 7, pl. v, figs. 1 & 2, pl. vi, figs. 4 & 5, & pl. ix, fig. 4, Port Phillip Heads; DENDY (4). *L. contorta*, Bwk., from Oceanic Coasts of France; TOPSENT, (2) p. 128. *L. coriacea* (Mont.), Bwk., Roscoff; *id.* (4) p. 530, and from Canaries, *id.* (1) p. 11; and from the Oceanic Coasts of France, *id.* (2) p. 128. *L. (?) laminoclathrata*, *L. osculum*, Carter spp.; DENDY, (4) pp. 69 & 70. *L. protogenes*, H. sp., pp. 58-60, pl. iii, fig. 1, & pl. ix, fig. 1, *tripodifera*, Carter sp., Port Phillip Heads, Western Point, and Bass's Straits, pp. 66-68, pl. ii, figs. 5 & 6, pl. v, figs. 3 & 4, pl. viii, figs. 5 & 6, & pl. ix, fig. 5, *ventricosa*, Carter sp., *id.* (4) pp. 60-62, pl. i, figs. 8-10, pl. iv, fig. 4, & pl. x, fig. 4, with *ventricosa*, n. var. *solida*, p. 62, pl. iii, fig. 3, near Port Phillip Heads, *id.* (4). *L. variabilis*, H., and *L. falcata*, H., Roscoff; TOPSENT (4) p. 531.

*L. depressa*, pp. 65 & 66, pl. iii, figs. 4 & 4a, pl. viii, fig. 8, & pl. xi, fig. 4, *dubia*, pp. 50 & 51, pl. i, fig. 3, & pl. ix, fig. 3, *lucasi*, pp. 45 & 46, pl. i, fig. 1, pl. iv, fig. 1, & pl. ix, fig. 1, *pelliculata*, pp. 54-56, pl. iii, fig. 2, pl. viii, fig. 7, & pl. x, figs. 1 & 2, *proxima*, pp. 62 & 63, pl. ii, figs. 1 & 2, pl. viii, figs. 1-4, & pl. xi, fig. 2, *pulcherrima*, pp. 52 & 53, pl. i, fig. 7, pl. iv, fig. 3, & pl. x, fig. 3, *stipitata*, pp. 51 & 52, pl. i, figs. 4-6, pl. iv, fig. 2, & pl. ix, fig. 5, *stolonifer*, pp. 46-48, pl. i, fig. 2, pl. vi, figs. 1-3, & pl. ix, fig. 2, *wilsoni*, pp. 63-65, pl. ii, figs. 3, 3a, & 4, pls. vii & xi, fig. 3, near Port Phillip Heads, DENDY (4) : n. spp.

*Nardoa* : the genus to be revived for Dendy's section *Radiata* of the *Homocela*, and to include *Leucosolenia tripodifera*, Dendy, and *L. (Ascandra) lieberkühnii*, H.; BIDDER, p. 627.

*Polejna*, v. L. : definition of genus ; VON LENDENFELD, (1) p. 294.

*P. telum*, n. sp., Lesina, VON LENDENFELD, (1) pp. 295 & 296, with a woodcut.

†*Polysteginina*, a new family of *Pharetrones* ; RAUFF, (1) pp. 281-284. [See under "Anatomy, Histology, &c.," p. 17, *suprà*.]

*Sycaltis leuconoides*, n. sp., BIDDER, p. 628, Naples.

*Sycandra*, H. : definition of genus ; VON LENDENFELD, (1) p. 240. *S. ciliata*, Fleming, Arran Is. ; HANITSCH, p. 214. *S. ciliata* : extraordinary development of spicules of fixation in some individuals ; TOPSENT, (6) pp. 56 & 57. *S. coronata*, Ellis & Sol., pp. 242-244, taf. xi, fig. 71, *elegans*, H., pp. 267-269, taf. xi, fig. 61, *humboldtii*, Risso, pp. 273-275, taf. xi, fig. 65, taf. xii, fig. 93, *quadrangulatum*, H., pp. 265-267, taf. xi, fig. 79, *raphanus*, O. S., pp. 246-257, taf. xi, fig. 78, taf. xiii, figs. 94-102, descriptions ; VON LENDENFELD (1). *S. coronata*, H., from Luc ; TOPSENT (6). *S. raphanus*, H., Red Sea ; KELLER, (1) p. 348 : a new variety from the Naples Aquarium ; BIDDER, p. 626. *S. schmidtii*, H., pp. 263-265, taf. xi, fig. 64, taf. xiii, figs. 109-111, *setosa*, O. S., pp. 257-262, taf. xi, fig. 60, taf. xii, figs. 85-92, Adriatic, descriptions ; VON LENDENFELD (1) [see also under *Sycon*].

*S. kelleri*, pp. 269-273, taf. xi, fig. 70, taf. xiii, figs. 103-108, Lesina, *tuba*, pp. 244-246, taf. xi, fig. 67, taf. xii, figs. 81-84, VON LENDENFELD (1) : n. spp.

‡ *Sycantha*, n. g., for *S. tenella*, n. sp., Trieste ; VON LENDENFELD, (1) pp. 235-238, taf. x, figs. 52-59, taf. xi, fig. 62.

*Sycetta*, definition of genus ; *S. conifera*, H., description, pp. 239 & 240, taf. xi, fig. 74 ; VON LENDENFELD (1). *S. stauridia*, H., Perim and Djedda ; KELLER, (1) p. 348.

*Sycocarpus*, H., subgenus of *Sycandra*, defined ; VON LENDENFELD, (1) p. 241.

*Sycocubus*, H. subgenus of *Sycandra*, defined ; VON LENDENFELD, (1) p. 263.

*Sycon coronatum* (Ell. Sol.), Polej., from Oceanic Coasts of France ; TOPSENT, (2) p. 128. *S. ciliatum* (Fabr.), Lieb., from Senegal ; *id.* (1) p. 13 : from Oceanic Coasts of France ; *id.* (2) p. 128.

*Sycortis quadrangulata*, H., from Luc. ; TOPSENT (6).

*Sycysa*, H. : definition of genus, p. 292 ; *S. huxleyi*, H., from Lesina, description, pp. 292-294, taf. xi, fig. 68 ; VON LENDENFELD (1).

*Teichonidæ* : the family should be abandoned, and its members distributed amongst other families, viz., *Teichonella prolifera* and *Eilhardia schulzei* among the *Leuconidæ*, and *Grantia labyrinthica* among the *Syconidæ* ; DENDY, (1) pp. 32-35 : the family to be abolished ; VON LENDENFELD (1).

*Ute*, O. S. : definition of genus, p. 282 ; *U. glabra*, description, pp. 282-284, taf. xi, fig. 63 ; VON LENDENFELD (1). *U. glabra*, O. S., from Oceanic Coasts of France ; TOPSENT, (2) p. 128.

*Vosmaria*, v. L. : definition of genus, p. 297 ; *V. corticata*, n. sp., VON LENDENFELD, (1) pp. 297-300, taf. xi, fig. 77, taf. xv, figs. 124-129, Lesina.

## 2. HEXACTINELLIDA.

*Acanthodictya*, Hinde, diagnosis of genus, p. 47; †*A. hispida*, Hinde, Siluro-Cambrian, Metis, pp. 48 & 49, figs. 18 & 19, pl. iii, fig. 8; DAWSON.

*Actinodictya*, n. g., for †*A. placenta*, n. sp.; HALL, p. 22, from Chemung Group, Steuben County, N.Y.

†*Astræospongia hamiltonensis*, Meek & Worthen, Devonian of Mackenzie River Basin; WHITEAVES, pp. 197 & 198, pl. xxviii, figs. 1 & 1a.

†*Astrocladia elegans*, p. 149, pl. vii, fig. 7, *elongata*, p. 148, pl. vii, fig. 6, *virguloides*, p. 149, pl. vii, figs. 8a-c, Cambrian, Canada, MATTHEW (1), n. spp.

*Brachiospongia*, Marsh, diagnosis and remarks on; †*B. digitata*, Owen sp., Cincinnati Group, Kentucky; JAMES, pp. 66-68, fig. 6.

*Chiroospongia*, S. A. Miller, diagnosis and remarks on; †*C. faberi*, S. A. Miller, Cincinnati Group, Cincinnati; JAMES, pp. 65 & 66.

†*Camerospongia schlüteri*, n. sp., POČTA, pp. 225 & 226, taf. viii, figs. 1a,b, Paderborn.

†*C. subrotunda*, Mant., and *C. sp.*, from Paderborn; *id.* pp. 225 & 226.

†*Coscinopora macropora*, Goldf., p. 219, and *C. sp.*, p. 30, Paderborn; POČTA.

†*Craticularia plicata*, n. sp., Paderborn, POČTA, pp. 218 & 219, taf. vi, figs. 2a, b, & taf. vii, figs. 2a, b. †*C. sp.*, Cretaceous, N. Bohemia; JAHN, p. 482.

†*Cryptodictya*, n. g., for †*C. allenii*, n. sp.; HALL, p. 22, from Chemung Group, Steuben and Cattaraugus Counties, N.Y.

†*Cyathospongia quebecensis*, HINDE; in DAWSON, pp. 44 & 45, figs. 16 & 17, pl. iii, fig. 7; *C. (?) eozoica*, MATTHEW, (2) pp. 42 & 43, fig. 1, Middle Division of Laurentian, St. John, N.B. : n. spp.

†*Dichoplectella*, n. g. for †*D. irregularis*, n. sp., MATTHEW, (1) p. 149, pl. vii, fig. 9a, b, Cambrian, Canada.

†*Dictyophyton sceptrum, vascellum, (Phragmodictya) halli*, and †*D. tomaculum*, from Chemung Group, Alleghany County, N. Y., †*D. randalli*, from Waverly Group, Warren, Pa., *scitum*, from Chemung Group, Chemung Narrows, N. Y., *amalthæa* from Chemung Group, Great Bend, Pa., HALL, p. 22 : n. spp.

†*Girvanella* sp. from Lower Cambrian; WALCOTT, p. 598, pl. liv, fig. 4.

†*Hyalostelia metisselia*, Siluro-Cambrian, Metis, HINDE; in DAWSON, pp. 49 & 50, fig. 20; †*H. minima*, Cambrian, Canada, MATTHEW, (1) p. 150, pl. vii, fig. 10 : n. spp.

†*Leptomitus zitteli*, Walcott, from Lower Cambrian; WALCOTT, p. 597.

†*Limosinion folium*, Rœm., from Paderborn; POČTA, pp. 226 & 227.

*Lyssakina* : remains from Upper Callovian; WISNIEWSKI, pp. 261-263.

*Pasceolus*, Billings : diagnosis, p. 58; †*P. globosus*, Bill., p. 58, *darwinii*, Miller, p. 59; †*P. (?) tumidus*, James, pp. 59 & 60, fig. 3, Cincinnati Group; JAMES.

†*Pleurostoma*, sp. indet., Cretaceous, N. Bohemia; JAHN, p. 482.

†*Plocoscyphia labyrinthica*, Rss., and †*P. fenestrata*, Smith, Cretaceous, N. Bohemia; JAHN, p. 482. *P. pertusa*, Gein., ? †*P. labyrinthica*, Mant., and †*P. sp.*, pp. 224 & 225, †*P. cavernosa*, Rœm., ? *P. reticulata*, Hinde, p. 223, taf. vi, figs. 3a, b, from Paderborn; POČTA.

†*P. arborescens*, p. 224, taf. viii, fig. 3, *prostrata*, pp. 223 & 224, Paderborn, POČTA; *P. (?) perantiqua*, Cambrian, Canada, MATTHEWS, (1) p. 148, pl. vii, figs. 5a, b : n. spp.

†*Protospongia coronata*, p. 41, figs. 8-10, pl. iii, fig. 4, *cyathiformis*, p. 43, figs. 13 & 14, pl. iii, fig. 5, *delicatula*, p. 43, fig. 15, *mononema*, pp. 40 & 41, figs. 5-7, & pl. iii, fig. 3, *polynema*, p. 42, figs. 11 & 12, pl. iii, fig. 5, *tetranema*, pp. 37-39, figs. 1-4, & pl. iii, figs. 1 & 2, Siluro-Cambrian, Metis, HINDE; in DAWSON : n. spp.

†*P. sp.* ? from Lower Cambrian; WALCOTT, p. 597, pl. xlix, fig. 2.

*Receptaculites*, De France : diagnosis and remarks on, pp. 60-62, fig. 4, †*R. circularis*, Emmons, Lorraine Shales, N. Y., p. 63, *dichhauti*, Ulrich, p. 63, *reticulatus*, Ulrich, p. 62, Cincinnati Group, Kentucky; JAMES.

†*Rhizopoterion cervicorne*, Goldf., Cretaceous, N. Bohemia; JAHN, p. 482.

†*Stephanella sancta*, n. g. & sp., HINDE, (1) pp. 22-24, 1 woodcut, from Ordovician, Ottawa, Canada.

†*Ventriculites angustatus*, Rœm., and †*V. radiatus*, Mant., Cretaceous, N. Bohemia; JAHN, p. 482. *V. cervicornis*, Goldf., pp. 7, 11, 13, 15, & 175, *pedester*, Eichw., pp. 11, 104, & 175, *plicatopunctatus*, Sinz., p. 11, *subradiatus*, Sinz., p. 11, *radiatus*, Mant., pp. 7, 11, 13, & 175, from Cretaceous, Russia; PIATNITZKY. ? †*V. radiatus*, ? †*V. infundibuliformis*, Woodw., †*V. angustatus*, Rœm., sp., ? †*V. multicostatus*, Rœm., pp. 220 & 221, †*V. sp.*, p. 222, taf. vii, figs. 3a-e, †*V. sp.*, p. 222, taf. viii, fig. 4, from Paderborn; POČTA.

†*V. spissorugatus*, n. sp., from Paderborn, POČTA, pp. 221 & 222, taf. viii, fig. 5.

### 3. TETRACTINELLIDA (with CHONDROSIDÆ, PLAKINIDÆ, HALISARCA, and OSCARELLA).

*Astylospongia*, Rœm., diagnosis; JAMES, p. 53.

*Chondrilla*, O. S. : definition of genus, *C. mixta*, F. E. S., Red Sea, *nucula*, O. S., p. 327, Bay of Assab, descriptions; KELLER (1).

*C. globulifera*, n. sp., KELLER, (1) pp. 327 & 328, taf. xviii, figs. 34 & 35, Coral Bays, N. of Suakin, 2-5 faths.

*Chondrosia plebeia*, O. S., from Canaries; TOPSENT (1) p. 13. *C. reniformis*, Ndo., from Oceanic Coasts of France; *id.* (2) p. 128.

*Chondrosidæ* : definition of family; KELLER, (1) p. 326.

†*Chonella sp.*, Paderborn; POČTA, p. 227.

*Cinachyra*, Sollas : definition of genus; KELLER, (1) p. 336.

*C. eurystoma*, Red Sea, pp. 338 & 339, taf. xix, figs. 46-48, *schulzei*, Aden, p. 337, taf. xix, figs. 41-43, *trochiformis*, Red Sea, p. 340, taf. xix, figs. 44 & 45, KELLER, n. spp.

*Craniella cranium*, auct., from Oceanic Coasts of France; TOPSENT, (2) p. 128.

†*Cupulochonia exquisita*, de Loriol, from Middle Valangian of Chamotte; PILLET.

*Cydonium arabicum* (Crtr.), Soll., from Red Sea; TOPSENT, (3) p. 22, pl. i, figs. 5 & 5a.

*Cylindrophyma* not to be included in the *Anomocladina*; RAUFF, (1) p. 281 (see under *Didymmorina*).

*Didymmorina*, n. fam., RAUFF (1), for the genera †*Cylindrophyma* and †*Didymosphæra*.

*Didymosphæra*, Link, see under *Didymmorina*.

*Discodermia*, Bocage: definition of genus; KELLER, (1) p. 345.

*D. stylifera*, n. sp., KELLER, (1) pp. 345-347, taf. xx, figs. 58-60, Dahlak Islands, Red Sea, 28 faths.

*Geodia barretti*, Bwk., var. *senegalensis*, n. var.; TOPSENT, (1) p. 15, from Senegal.

†*G.* remains from Upper Callovian; WISNIOWSKI, p. 264.

*Halisarca dujardini*, Johnst., from Roscoff; TOPSENT, (4) p. 532.

*Hindia*, Duuc.: diagnosis; †*H. parva*, from Cincinnati Group, probably synonymous with †*Microspongia gregaria*; JAMES, p. 56.

†*Isoraphinia simplicissima*, n. sp., POČTA, p. 229, pl. vi, figs. 1a, b, Paderborn.

*Normania*, Bwk.: for use of this generic name, see NORMAN, p. 449.

*Oscarella lobularis* (O. S.), Vosm., from Roscoff; TOPSENT, (4) p. 532.

*Pachastrella*, O. S.: definition of genus; *P. exotica*, O. S., description, pp. 343-345, pl. xix, fig. 53, pl. xx, fig. 54, Perim, 28 faths.; KELLER (1).

*Pachastrellidae*: definition of family; KELLER, (1) p. 343.

*Pachymatisma johnstonia*, Bwk., from Oceanic Coasts of France; TOPSENT, (2) p. 128: from Roscoff; *id.* (4) p. 531.

†*Pachypoterion cupulare*, n. sp., POČTA, pp. 228 & 229, taf. vii, figs. 1 & 1a, from Paderborn.

*Placina monolopha*, F. E. S., from Roscoff; TOPSENT, (4) p. 531.

†*Phymatella* sp., Paderborn; POČTA, p. 230.

*Pilochrota lactea* (Cart.), Soll., Roscoff; TOPSENT, (4) p. 531.

*Pæcillastra*, Soll., should be given up; see NORMAN, p. 449.

*Samus*, Gray; the genus does not belong to the *Clionidae*, and is a true *Tetractinellid*; TOPSENT, (5) p. 589.

†*Scytalia pertusa*, Rss., †*S. pertusa*, var. *elongata*, Počta, and †*S.*, sp. indet., Cretaceous, N. Bohemia; JAHN, p. 482.

†*Spongites saconicus*, Gein, Cretaceous, N. Bohemia; JAHN, p. 482.

†*Stellispongia bernensis*, for *Ceriospongia bernensis*, Et.; FELIX, p. 172, taf. xxvii, fig. 29, from Upper Jura of Oaxaca, Mexico.

*Stelletidae*: definition of family; KELLER, (1) p. 341.

*Stelletta collingsii*? (Bwk.), O. S., from Luc.; TOPSENT, (6) p. 59.

*S. siemensi*, n. sp., KELLER, (1) pp. 341-343, taf. xix, figs. 50-52, taf. xx, figs. 55-57, Southern part of Red Sea, 18 faths.

*Stryphnus ponderosus* (Bwk.), Soll., from Oceanic Coasts of France ; TOPSENT, (2) p. 128.

*Tetilla arabica*, Crtr., from the Island Masira, Coast of Arabia, p. 336, *T. dactyloidea*, Crtr., description, pp. 335 & 336 ; KELLER (1).

*Tetillidæ* : definition of family ; KELLER, (1) p. 335.

*Tetracladidæ* : definition of family ; KELLER, (1) p. 345.

† *Thecosiphonia grandis*, Roem., Paderborn ; POČTA, pp. 230 & 231, taf. viii, fig. 2.

† *Toriscodermia* sp., spicules from Upper Callovian, WISNIOWSKI, p. 264.

† *Verruculina*, sp., Paderborn, POČTA, pp. 227 & 228.

#### 4.—MONAXONIDA (with TETHYADÆ).

KELLER (1) suggests the following alterations in the classification of the Monaxonida Oligoceratina. The family *Homorhaphidæ* contains two distinct though related families, *Renieridæ* and *Chalinidæ*. Near the latter come the *Heterorhaphidæ*. The *Suberitidæ* are sharply limited, and near them should come the *Spirastrellidæ* and also the *Placospongidæ*, which are shown to be *Clavulina* by their pin-shaped spicules, while their siliceous spheres have arisen from spirasters. The *Tethyadæ* should be placed near *Clavulina* as *Pseudotetrazonina*, and a degenerate branch from them are the *Ohondrosidæ*. The genus *Latrunculia* should be a special family *Latrunculidæ*.

*Alectona*, Carter : revision of the genus and criticism of the species described ; TOPSENT, (5) pp. 586–588. *A. millari*, Carter, var., inhabiting shells of *Lima excavata*, Fabr., Christiania and the Scandinavian Coast ; for description see JENNINGS.

*Amorphina* : definition of genus ; KELLER, (1) p. 312. *A. isthmica*, Keller, from northern shore of the Timsah Sea, Isthmus of Suez ; *id.* (1) p. 312. *A. bretti* (Bwk.), O. S., from Luc ; *A. viridans*, Bwk., sp. to be abolished, the name having been given to specimens of *Hymeniacidon caruncula*, Bwk. ; TOPSENT, (6) p. 55.

*Azinella dissimilis*, Bwk., & *A. distorta*, Bwk., from Oceanic Coasts of France ; TOPSENT, (2) p. 129.

*Bubaris*, Gray : definition of genus modified, p. 546, *B. vermiculata* (Bwk.), Gray, p. 545, *verticillata* (Bwk.), Gray, pp. 546 & 547, pl. xxii, fig. 7, Roscoff ; TOPSENT (4).

*Ceraochalina implexa*, n. sp., TOPSENT, (3) pp. 27 & 28, pl. i, fig. 6, Red Sea.

*Chalina gracilentia, oculata*, Bwk., from Oceanic Coasts of France ; TOPSENT, (2) p. 128. *C. limbata* (Mont.), Bwk., from Senegal ; *id.* (1) p. 13. *C. montaguï*, Johnst., from Port Eriu, Isle of Man ; HERDMAN, p. 28.

*Clathria frondifera* (Bwk.), Ridley, from Red Sea ; TOPSENT, (3) p. 23, pl. i, fig. 4.



*Clionidae* constitute a natural family to be placed in the *Monaxonidae*, sub order *Spintharophora*, group *Heterosclera*, and section *Clavulidae*, and to be defined as "Boring *Clavulidae*"; TOPSENT, (5) p. 588.

*Cliona*, Grant: revision of the genus and criticism of all the species yet described; TOPSENT, (5) pp. 556-573. *C. celata*, Grant, and *C. vastifica*, Hanc., from Oceanic Coasts of France; *id.* (2) p. 129. *C. lobata*, Hanc., from Roscoff; *id.* (4) p. 548.

*C. indica*, Ceylon, p. 574, pl. xxii, figs. 15a, a', b, b'; *C. julieni*, La Réunion, p. 573, pl. xxii, figs. 9a, b, TOPSENT (5): n. spp.

† *Damiria*, n. g., p. 308, for *D. simplex*, n. sp., near the I. of Perim, in 18 faths., KELLER, (1) p. 309, taf. xvi, figs. 1 & 2.

*Dendoryx incrustans* (Johnst.), Gray, from Oceanic Coasts of France; TOPSENT, (2) p. 128. *D. luciensis*, Tops., from Luc.; *id.* (6).

*Desmacella annexa*, O. S., from Oceanic Coasts of France; TOPSENT (2) p. 128.

*Desmacidon fruticosa* (Johnst.), Bwk., from Oceanic Coasts of France; TOPSENT, (2) p. 128. *D. fucorum*, Johnst., Arran Is.; HANITSCH, p. 214.

*Dictyocylindrus virgultosus*, Bwk., from Luc.; TOPSENT (6).

*Dotona pulchella*, Carter, to be united with *Alectona higgini*, Carter, and the genus to be given up; TOPSENT, (5) p. 587.

*Echinodictyum jousseaumei*, n. sp., TOPSENT, (3) pp. 24 & 25, pl. i, fig. 3, from Red Sea.

*Ephydatia fluviatilis*, Gray, Lake Manindjau, Sumatra, pp. 32 & 33; *E. sp.*, indet., Buitenzorg, Java, p. 44; WEBER (1).

*E. borogensis*, n. sp., WEBER, (1) pp. 33-35, pl. iv, fig. 11, Ponds in Buitenzorg, Java, and Macassar, Celebes.

*Eesperella macilentia* (Bwk.), Vosm., and *E. sordida* (Bwk.), Vosm., Roscoff; TOPSENT (4) p. 537. *E. modesta* (O. S.), Vosm., *E. agagropila* (Johnst.), *E. lingua* (Bwk.), Vosm., *E. sordida* (Bwk.), Vosm., from Oceanic Coasts of France; *id.* (2) p. 128. *E. sordida*, Bwk. sp., Arran Is.; HANITSCH, pp. 214-217, pl. xi, figs. 1-9.

*E. fibrexilis*, WILSON (no description), Woods' Holl, Massachusetts; *E. littoralis*, from Roscoff and Luc, TOPSENT, (4) pp. 537-539, pl. xxii, fig. 8: n. spp.

*Gellius angulatus* (Bwk.), R. & D., from Oceanic Coasts of France; TOPSENT, (2) p. 128.

*Grayella*, Carter: definition of genus; KELLER, (1) p. 328.

*Halichondria*, Fleming: definition of genus; KELLER, (1) p. 309. *H. angulata*, var. *typica*, Tops., to be *Reniera angulata*; TOPSENT, (6) p. 54. *H. caduca*, Bwk., from Senegal; *id.* (1) p. 13. *H. caruncula*, Bwk., Arran Is.; HANITSCH, p. 214. *H. membrana*, Bwk., Roscoff; TOPSENT, (4) p. 533. *H. panicea*, auct., from Oceanic Coasts of France; *id.* (2) p. 128.

*H. inops*, from Roscoff, TOPSENT, (4) p. 533, pl. xxii, fig. 1; *H. glabrata*, Bay of Assab, 10 metres, p. 311, taf. xvi, fig. 9, *granulata*, Coral Reefs of Suakin, 2 faths., p. 310, taf. xvi, fig. 8, *minuta*, near Perim, 18 faths., p. 311, *tuberculata*, Bay of Assab, p. 310, taf. xvi, fig. 10, KELLER (1): n. spp.

*Heteromeyenia argyrosperma*, Potts, *ryderi*, Potts, and *pictovens*, Potts, Canada ; MAC KAY, pp. 93 & 94.

*Heterorhaphidæ* : definition of family ; KELLER, (1) p. 312.

*Hymedesmia stellata*, Bwk., from Luc. ; TOPSENT (6).

*Hymeniacion sanguinea* (Gr.), Bwk., and *caruncula*, from Oceanic Coasts of France ; TOPSENT, (2) p. 129.

*Hymeraphia clavata*, Bwk., from Luc. ; TOPSENT (6). *H. echinata*, = ? *Trachytedania echinata*, Hope, pp. 540 & 541, *simplex*, Bwk., and *coronula*, Bwk., pp. 539 & 540, Roscoff ; TOPSENT (4).

*H. lacazei*, n. sp., from Roscoff, TOPSENT, (4) pp. 541 & 542, pl. xxii, figs. 4 & 5.

*Iophon hyndmani*, Bwk. sp., Arran Is. ; HANITSCH, pp. 217 & 218.

*Lasiothria*, Hinde : diagnosis of genus ; DAWSON, p. 50. *L. curvica*, Hinde, Siluro-Cambrian, Metis ; *id.* p. 51, fig. 21.

† *L. flabellata*, n. sp., Siluro-Cambrian, Metis, HINDE ; in DAWSON, pp. 51 & 52, fig. 22.

*Meyenia everetti*, Mills, *fluviatilis*, L., Canada ; MAC KAY, pp. 92 & 93.

*Microciona ambigua*, Bwk., Roscoff ; TOPSENT, (4) p. 543. *M. plumosa*, Mont., from Oceanic Coasts of France ; *id.* (2) p. 128.

*M. dives*, n. sp., from Roscoff, TOPSENT, (4) pp. 543 & 544, pl. xxii, figs. 2 & 3.

† *Monilites* aff. *haldonensis*, Carter, Upper Callovian ; WISNIOWSKI, p. 263.

*Myxilla peachii*, Bwk., from Roscoff ; TOPSENT, (4) p. 539.

*Phakellia ventilabrum* (Johnst.), Bwk., from Oceanic Coasts of France ; TOPSENT, (2) p. 129.

*Placospongidæ* : definition of family ; KELLER, (1) p. 324.

*Placospongia*, Gray : definition of genus ; *P. melobesioides*, Gray, Red Sea, description, pp. 324-326, taf. xviii, figs. 29-31 ; KELLER (1).

*Plocamia micracionides* (Carter), O. S., from Roscoff ; TOPSENT, (4) p. 544.

† *Pocillon*, n. subg., for the species of *Myxilla* without bipocilli : *Myxilla* (*Pocillon*) *implicata*, Bwk., from Roscoff ; TOPSENT, (4) p. 539.

*Polymastia robusta*, Bwk., from Oceanic Coasts of France ; TOPSENT, (2) p. 129.

*Raspailia ramosa*, Mont., and *R. stuposa*, Mont., Roscoff ; TOPSENT, (4) p. 548. *R. ramosa*, *stuposa*, *hispida* (Mont.), from Oceanic Coasts of France ; *id.* (2) p. 129.

*Renieridæ* : definition of family ; KELLER, (1) p. 303.

*Reniera*, Nardo : definition of genus ; KELLER, (1) p. 304. *R. angulata*, for *Halichondria angulata* var. *typica* ; TOPSENT, (6) p. 54. *R. densa* ?, Bwk., from Arran Is. ; HANITSCH, p. 214. *R. fistulosa*, Bwk., from Oceanic Coasts of France ; TOPSENT, (2) p. 128. *R. ingalli*, Bwk., from Isle of Man ; HERDMAN, p. 28.

† *R. moniliformis*, Wisn., Upper Callovian ; WISNIOWSKI, p. 263.

*R. normani* (Bwk.), O. S., from Luc. ; TOPSENT (6). *R. parasitica*, Bwk., from Oceanic Coasts of France ; *id.* (2) p. 128. *R. rosea*, Bwk.,

*viscosa*, Tops., and *elegans*, Bwk., from Roscoff; *id.* (4) pp. 534 & 535. *C. scyphonoides*, Lam., from Coral Reefs of Suakin, description; KELLER, (1) p. 305, taf. xvi, fig. 4.

*R. coccinea*, p. 307, taf. xvi, figs. 5 & 6, *elastica*, p. 306, taf. xvi, figs. 3 & 7, *ridleyi*, p. 308, Red Sea, KELLER (1); *R. spiculotenuis*, Canaries, TOPSENT, (1) p. 12, pl. ii, figs. 3 & 4 : n. spp.

*Sapline*, Gray : definition of genus; KELLER, (1) p. 321.

*S. massa*, n. sp., KELLER, (1) p. 321, taf. xvii, figs. 25 & 26, Reefs of Suakin.

*Sclerochalina fistularis*, pp. 25 & 26, pl. i, fig. 1, *sinuosa*, pp. 26 & 27, pl. i, fig. 2, Red Sea, TOPSENT (3), n. spp.

*Spirastrellidae*, sensu restricto; KELLER, (1) p. 322.

*Spirastrella*, O. S. : definition of genus, p. 322; *S. decumbens*, Ridley, Suakin, 15 metres, description, p. 323, taf. xviii, figs. 27, 28, 32, & 33; KELLER (1).

*Spongillidae* : for a complete list of genera and species, with numerous figures, see WELTNER, pp. 208-222; for the distribution, see *id.* pp. 222-226. *Spongillid* sp., from a stream in Luwu, Central Celebes; WEBER, (1) p. 44.

*Spongilla cinerea*, Carter, River Batjo, W. Coast of Celebes, pp. 35-37; *S. sp.*?, Singkarak Lake, *S. sp.*?, Lake Situ, Java, and *S. sp.*?, W. Java, pp. 42 & 43; WEBER (1). *S. fragilis*, Leidy, pp. 88 & 89, *lacustris*, L., p. 90, *mackayi*, Carter, p. 89, *terranova*, Potts, p. 91, Canada; MACKAY.

*S. decipiens*, River Lapadi or Sareminja, W. Coast of Celebes, pp. 40-42, pl. iv, figs. 1-5, *sumatrana*, Lake of Singkarak, pp. 38-40, pl. iv, figs. 6-10, WEBER (1) : n. spp.

*Stylinos columella*, for *Desmacidon columella*, Bwk., pp. 536 & 537, pl. xxii, figs. 6a, b; *S. simplicissima* and *uniformis*, Bwk., Roscoff, pp. 535 & 536; TOPSENT (4).

*Suberitidae* : definition of family; KELLER, (1) pp. 314 & 315.

*Suberites*, Nardo : definition of genus; *S. carnosus*, Johnston, Reefs of Suakin, description; KELLER, (1) p. 315, taf. xvii, fig. 15. *S. carnosus* (Johnst.), O. S., from Oceanic Coasts of France; TOPSENT, (2) p. 129. *S. domuncula*, Ndo., Killery Bay, W. Coast of Ireland; HANITSCH, pp. 218 & 219. *S. domuncula*, Ndo., p. 15, *ficus* (Johnston), O. S., from Senegal, p. 14; TOPSENT (1); *S. ficus*, from Oceanic Coasts of France; *id.* (2) p. 129. *S. ficus*, Esper, W. Coast of Ireland, 5-15 faths.; HANITSCH, p. 219.

*S. clavatus*, Reefs of Suakin and Suez, p. 316, taf. xviii, figs. 37-39, *incrustans*, Bay of Assab, p. 318, taf. xvii, figs. 19 & 20, *mastoideus*, Reefs of Suakin, p. 317, taf. xvii, figs. 16-18, KELLER (1) : n. spp.

*Tedantia*, Gray : definition of genus; KELLER, (1) p. 312. *T.*, sp. from Red Sea; TOPSENT, (3) pp. 23 & 24.

*T. assabensis*, Bay of Assab, 10 metres, KELLER, (1) p. 313, taf. xvi, figs. 11 & 12; *T. brucei*, Bahamas, WILSON (no description); *T. chevreuxi*, Senegal, TOPSENT, (1) pp. 13 & 14, pl. ii, figs. 1 & 2 : n. spp.

↓ *Tedanione*, n. g., for *Tedania fetida*, WILSON (no description), Bahamas.  
*Terpios*, Duch. & Mich. : definition of genus ; KELLER, (1) p. 319.  
*T. lendenfeldi*, Perim, p. 320, *viridis*, Coral Reefs of Suakin, p. 319, taf. xvii, figs. 21-24, KELLER (1) : n. spp.

*Tethyde* : definition of family ; KELLER, (1) p. 329.

*Tethya*, Lam. : definition of genus ; KELLER (1). *T. seychellensis*, Sollas, Coral Reefs of Suakin, Red Sea, description ; KELLER, (1) pp. 329 & 330, taf. xviii, fig. 36. *T. lyncurium*, Lam., from Senegal, TOPSENT, (1) p. 15 ; from Oceanic Coasts of France ; *id.* (2) p. 129.

† *T. lyncurium*, from Aquitanian and Tortonian, Carry, near Marseilles ; GOURRET, p. 132.

*Thoosa*, Hancock : revision of the genus and criticism of the species hitherto described ; TOPSENT, (5) pp. 577-580, and synopsis of the genus, pp. 585 & 586. *T. hancocki*, Tops., diagnosis, p. 580 ; *id.* (5).

*T. circumflexa*, pp. 583 & 584, pl. xxii, figs. 10a-c, *fischeri*, Ceylon, pp. 582 & 583, pl. xxii, figs. 16a-h, *letellieri*, pp. 580 & 581, pl. xxii, figs. 17a-e, TOPSENT (5) : n. spp.

*Trachytedania*, Ridley : definition of genus ; KELLER, (1) p. 314.

*T. arborea*, n. sp., KELLER, (1) p. 314, taf. xvi, figs. 13 & 14, Red Sea.

† *Tripospherilla pocta*, Wisn., Upper Callovian ; WISNIOWSKI, p. 263.

*Tubella pennsylvanica*, Potts, Canada ; MACKAY, p. 95.

## 6.—KERATOSA.

*Aplysilla rubra*, for *Halisarca rubra* ; HANITSCH, pp. 219-221, pl. xii, figs. 1-6, Arran Is. *A. sulfurea*, F. E. S., and *A. rosea* (Barrois), F. E. S., Roscoff ; TOPSENT, (4) p. 532. *A. aerophoba*, Ndo., from Canaries ; *id.* (1) p. 12.

*Spongelia fragilis* (Johnst.), O. S., Roscoff ; TOPSENT, (4) p. 533 : from Oceanic Coasts of France ; *id.* (2) p. 128. *S. pallescens*, O. S., from Senegal ; *id.* (1) p. 13. *S.*, sp. from Red Sea : *id.* (3) p. 28.

## 7. INCERTÆ SEDIS (FOSSIL FORMS).

*Cilindrospongia angustata*, from Cretaceous, Russia ; PIATNITZKY, p. 115.

*Criborespongia dubia*, Rœm., from Cretaceous, Russia ; PIATNITZKY, p. 118.

*Cyathophycus*, Walcott, diagnosis and remarks on ; JAMES, pp. 63 & 64.

*C. siluriana*, n. sp., JAMES, pp. 64 & 65, fig. 5, Cincinnati Group, Cincinnati.

↓ *Cyclosporgia discus*, n. g. & sp., MILLER, p. 5, pl. i, figs. 8 & 9, Corniferous Limestone, Indiana.

*Cylindrocaccia*, Ulrich, diagnosis ; JAMES, p. 56.

*C. covingtonensis*, Ulrich, from Covington, Kentucky (Cincinnati Group) ; JAMES, pp. 56 & 57.

*Dystactospongia*, S. A. Miller, diagnosis ; *D. insolens*, Mill., *minima*, Ulrich, Cincinnati Group ; JAMES, pp. 70 & 71.

*Halichondrites graphitiferus*, Upper Laurentian of St. John, N. B., MATTHEW, (2) pp. 43 & 44, fig. 2 ; *H. confusus*, Siluro-Cambrian, Metis, HINDE ; in DAWSON, p. 52, fig. 23 : n. spp.

*Heterospongia*, Ulrich, diagnosis and remarks on ; †*H. aspera*, sub-ramosa, Ulrich, Cincinnati Group ; JAMES, pp. 71 & 72.

*Leptopoterion*, Ulrich, diagnosis ; JAMES, p. 54.

*Microspongia*, Miller & Dyer, diagnosis ; *M. gregaria*, Miller & Dyer, subrotundus, James, from Cincinnati Group ; JAMES, pp. 54-56, fig. 1.

*Mæandrospongia cavernosa*, Røem., from Cretaceous, Russia ; PIATNITZKY, p. 118.

*Meandropotichium impressum*, Sing., *M.* sp., from Cretaceous, Russia ; PIATNITZKY, p. 11.

*Palæacis cavernosa*, n. sp., Subcarboniferous, Indiana, MILLER, pp. 4 & 5, pl. i, figs. 5 & 6.

*Palæospongia prisca* is a real Sponge, and not the result of worm tubes ; BORNEMANN, pp. 492-494. *P. prisca*, Bornemann, is not a Sponge, nor remains of animals or plants, but the result of mechanical causes ; RAUFF, (2) pp. 92-100.

*Pattersonia*, S. A. Miller, diagnosis and remarks on ; †*P. difficilis*, S. A. Miller, *tuberosa*, Beecher sp., Cincinnati Group, Cincinnati ; JAMES, pp. 68 & 69.

*Rhombodictyon*, Whitfield, diagnosis ; JAMES, p. 57.

*R. globosus*, n. sp., JAMES, pp. 57 & 58, fig. 2, from Cincinnati Group, Cincinnati.



# PROTOZOA.

BY

CECIL WARBURTON, M.A.

## I.—LIST OF PUBLICATIONS.\*

- ANON. Istruzioni per la raccolta, la preparazione e la Conservazione dei Foraminiferi viventi e fossili. Riv. Ital. Sci. Nat. xi, pp. 3, 26, & 45.
- BALBIANI, E. G. (1) Sur les régénérations successives du péristome comme caractère d'âge chez les *Stentors* et sur le rôle du noyau dans ce phénomène. Zool. Anz. xiv, pp. 312-316 & 323-327, 6 figs. Abstract in J. R. Micr. Soc. 1891, p. 751.
- . (2) Sur la formation des monstres doubles chez les *Infusoires*. J. Anat. Phys. xxvii, pp. 169-196, 2 pls.
- BEISSEL, I. Die *Foraminiferen* der Aachener Kreide. Berlin: 1891, 8vo, with 4to atlas, 16 pls.
- BIANCO, S. Lo. Metodos usados en la estación zoológica para la conservación de los animales marinos. An. Soc. Esp. xx, pp. 273-322. *Protozoa*, p. 286.
- BINET, A. German Version of his Paper on the Psychic Life of Micro-organisms. Halle (Schwetschke): 1891, 8vo. [See Zool. Rec. xxvi, *Prot.*, BINET.]
- BLASIUS, W. Die Faunistische Litteratur Braunschweigs und der nachbargebiete. J. Ber. Ver Braunschw. vi, p. 293. *Protozoa*, p. 339.
- BORGERT, A. Ueber die *Dictyochiden*, insbesondere über *Distephanus speculum*; sowie Studien an Phaeodarien. Z. wiss. Zool. li, pp. 629-676, 1 pl., 2 woodcuts. Abstract in J. R. Micr. Soc. 1891, p. 611. *Sagenoarium*, n. g.

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\* An asterisk prefixed to a quotation indicates that the Recorder has not seen the Journal or Work referred to.

BOURNE, A. G. On *Pelomyxa viridis*, n. sp., and on the Vesicular Nature of Protoplasm. Q. J. Micr. Sci. xxxii, pp. 357-374. Abstract in J. R. Micr. Soc. 1891, p. 612.

BURGESS, E. W. *Foraminifera* of Hammerfest. Mid. Nat. xiv (1891), pp. 153-158.

Some rare, none new.

CALVIN, S. Abstract of his account of Gigantic Specimens of *Actinosphaerium*. J. R. Micr. Soc. 1891, p. 55. [See Zool. Rec. xxvii, *Prot.*, CALVIN.]

CERTES, A. (1) Note sur deux Infusoires nouveaux des environs de Paris. Mém. Soc. Zool. Fr. iv, 1891, 6 pp., 1 pl.; also Bull. Soc. Zool. xvi, p. 82.

*Conchophthirius metschnikoffi* and *Odontochlamys gouraudi*.

— (2) Sur le procédé de M. Joseph Eismond pour l'étude des Infusoires vivants. Bull. Soc. Z. Fr. xvi, p. 93.

— (3) Sur le *Trypanosoma balbiani*. T. c. p. 95. Note complémentaire; t. c. p. 130.

CHAPMAN, F. The *Foraminifera* of the Gault of Folkestone. J. R. Micr. Soc. 1891, pp. 565-575, 1 pl.

3 new species.

CUNEO, G. Sui Protisti delle acque di Rapallo. Boll. Scient. xii, pp. 140-149.

None new.

DADAY, —. Beiträge zur mikroskopischen süßwasserfauna Ungarns. Term. füzetek, xiv, pp. 107-123, 1 pl.

Some *Protozoa*: none new.

\*DALLA-TORRE, K. W. VON. Studien über die mikroskopische Thierwelt Tirols. I. *Rotatoria*; II. *Infusoria*, *Flagellata*; III. *Infusoria*, *Ciliata* and *Tentaculifera*. Ferdinaneum Tirol Vorarlberg. iii, pt. 33, pp. 239-252; pt. 34, pp. 260-273, and pt. 35, pp. 193-209.

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New genus *Salinella*.
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None new.

IMHOFF, O. E. (1) Die Fauna des Bodensees. Zool. Anz. xiv, pp. 42-44. Some species of *Flagellata* ; none new.

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67 species, *Foraminifera*, none new, on pp. 149-162.
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1 new species, new genera *Cystobia*.
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5 new genera, 8 new species.
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— (2) On the Occurrence in the Fresh Waters of Calcutta of Reticulated *Amœba*. Am. Micr. J. xii, p. 112.

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*Trichotaxis*, n. g.

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*Glugea microspora*, n. g. & sp.

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WERNICKE, R. Les Protozoaires pathogènes. J. Microgr. xv, pp. 14-19 & 48-52.

Nothing new.

WISNIEWSKI, T. Mikrofauna ilów ornatowch okolicy Krakowa. I. Otwornice górne Kellowayn w Grojcu. Pam. Akad. umiej. wyd. przyr. Krakau, xvii, pp. 181-242, 3 pls.

Many species of *Foraminifera*. Some undetermined, but none described as new.

WOLTERS, M. Die Conjugation und Sporenbildung bei Gregarinen. Arch. mikr. Anat. xxxvii, pp. 99-138, 4 pls. See J. R. Micr. Soc. 1891, p. 357.

WRIGHT, J. Report on the *Foraminifera* obtained off the S.W. of Ireland during the Cruise of the 'Flying Falcon,' 1888. P. R. Irish Ac. (3) i, pp. 460-502, 1 pl.

## II.—ANATOMY, BIOLOGY.

## 1. GENERAL MORPHOLOGY.

GREGORY (Q. J. Geol. Soc. xlvii, p. 467) has been unable to find any trace of organic structure in the "Tudor specimen of *Eozoon*," which was found in a deposit of pure Carbonate of Lime.

DREYER (Jen. Z. Nat. xxvi, p. 204) has a beautifully illustrated paper on the skeletal structures of *Rhizopoda*, *Sponges*, and *Echinoderms*.

BALBIANI (J. Anat. Phys. xxvii, p. 169) deals with the duplication occasionally noticeable among Infusorian forms.

*Methods of Preservation and Preparation.*

LO BIANCO (An. Soc. Esp. xx, p. 273) details certain methods of preservation of marine animals. For *Protozoa*, see p. 286.

CERTES (Bull. Soc. Zool. xvi, p. 193) strongly advocates Eismond's methods of preparing *Infusoria*. See also Riv. Ital. Sci. Nat. xi, p. 306.

## 2. REPRODUCTION.

WOLTERS has observed conjugation in *Monocystes* and *Clepsidrina*. *Klossia* does not conjugate. The spore-formation in these forms is described (Arch. mikr. Anat. xxxvii, p. 99).

ISCHIKAWA (Zool. Anz. xiv, p. 12) describes the process of conjugation in *Noctiluca*.

See also HARTOG, ISCHIKAWA & PERRONCITO.

## 3. PHYSIOLOGY.

LE DAUDEC (Bull. Sci. Fr. Belg. xxiii, pp. 261-328) has experimented on the digestion of *Protozoa*. In every group he finds that the ingested food is presently surrounded by an acid secretion, which is apparently the same in each case. The specific action of this acid on the various constituents of the ingested food is discussed.

GREEF (SB. Ges. Marb. iii, p. 21) has observed muscular fibrillæ in the ectosark of *Amæba terricola*.

FAGGIOLI has a paper on the action of the blood upon *Protista*.

LINTON describes the production of wart-like excrescences on Minnows by *Psorosperms*. Bull. U. S. Fish. Comm. ix, p. 99.

For pathogenic *Protozoa*, see also WERNICK, J. Microgr. xv, p. 14.

## III.—GEOGRAPHICAL DISTRIBUTION.

*General*.—MINGAZZINI deals with the Geographical Distribution of Polycystic Gregarines; Atti [Rend.] Acc. Rom. 1891, vii, p. 234.

*British Isles*.—The *Foraminifera* of the Gault of Folkestone are the subject of a paper by CHAPMAN, J. R. Micr. Soc. 1891, p. 565.

HOLT gives some *Protozoa* from St. Andrew's Bay ; Ann. N. H. (6) viii, p. 182.

LORD deals with Rossendale *Rhizopoda*.

PEARCEY gives some *Foraminifera* dredged in Liverpool Bay ; 4th Rep. Liverp. Mar. Biol. Stat. p. 42.

WRIGHT reports on the *Foraminifera* dredged off the S.W. Coast of Ireland ; P. R. Irish Ac. (3) i, p. 460.

*Central Europe*.—For German *Foraminifera* see BEISSEL.

For the literature on the *Protozoa* of the neighbourhood of Brunswick, see BLASIUS, J. Ber. Ver. Braunschw. vi, p. 339.

DADAY gives some *Protozoa* among his "Microscopic Freshwater Fauna of Hungary" ; Term. füzetek, xiv, p. 107 : and DALLA-TORRE deals with the *Infusoria* of the Tyrol (Ferdinaneum Zeitschr. iii, pt. 3, p. 239).

For Pomeranian *Foraminifera* see DEECKE, MT. Vorpomm. xxii, p. 71.

IMHOF gives some *Flagellata* from the Boden See, and some *Protozoa* from the Black Forest ; Zool. Anz. xiv, pp. 38 & 42.

WISNIOWSKI gives several *Foraminifera* from Krakow.

LIENENKLAUS gives 67 species of *Foraminifera* from Doberg.

PENARD gives some species (1 new) of *Rhizopoda* from Lake Geneva ; Arch. Sci. Nat. xxvi, p. 134.

For a catalogue of shell-bearing *Rhizopoda* from Wiesbaden, see PENARD, JB. nass. Ver. xliii, p. 67.

PERNER gives some fossil *Radiolaria* from Bohemia ; SB. böhm. Ges. 1891, p. 255.

For fossil *Foraminifera* of Lower Austria, see RZEHAK, Ann. Hof-museum Wien, vi, p. 1.

*Norway*.—BURGESS (Mid. Nat. xiv, p. 153) deals with the *Foraminifera* of Hammerfest.

*France*.—DE GUERNE & RICHARD (Bull. Soc. Z. Fr. xvi, p. 112) give a few *Protozoa* from the neighbourhood of Cazan and Hourtins (France).

*Italy*.—For the *Protista* of Rapallo (Italy), see CUNEO, Boll. Scient. xii, p. 140.

ISSEL (Ann. Mus. Genov. xxix, p. 91) gives some fossils from the chalk of Trebbia.

MINGAZZINI (Atti [Rend.] Acc. Rom. vii, p. 229) gives some new *Gregarina* from the Gulf of Naples.

*Asia*.—For the *Foraminifera* of Japan, see NAUMANN & NEUMAYR, Denk. Ak. Wien, lvii, p. 26.

VERBEEK gives a preliminary note on fossil *Protozoa* from Java ; JB. Mineral. i (Dec. 1891) p. 65.

*America*.—For *Protozoa* of the Argentine Republic, see FRENZEL.

PERRY deals with the freshwater *Rhizopoda* of Oakland County, Michigan ; Am. Micr. J. xii, p. 80.

STOKES (J. R. Micr. Soc. 1891, p. 697) gives descriptions of 15 new *Infusoria* from the Fresh Waters of the United States.

*Australia*.—HOWCHIN gives some *Foraminifera* from the estuary of Port Adelaide River ; Tr. R. Soc. S. Austr. xiii, p. 161.

## IV.—SYSTEMATIC.

BORGERT does not agree with Hæckel and others in placing the *Dictyochida* among the *Radioluria*. He considers them an order of *Mastigophora*, and suggests the name *Silicoflagellata*. [*Z. wiss. Zool.* li, p. 629.]

For the affinity between the *Sarcosporidae* and the *Microsporidae*, see MINGAZZINI, Atti [*Rend.*] Acc. Rom. (4) vii, p. 136.

## A.—GYMNOMYXA.

## Class 3.—LOBOSA.

## Order 1. NUDA :—

*Amœba pellucida*, *A. cubica*, n. spp., FRENZEL, Arch. mikr. Anat. xxxviii, pl. i, figs. 1, 2, & 4.

*Protamœba flava*, n. sp., *id. t. c.* fig. 3.

† *Nuclearella variabilis*, n. g. & sp., *id. t. c.* figs. 8 & 9.

† *Chromatella argentina*, n. g. & sp., *id. Z. wiss. Zool.* liii, p. 338.

† *Gringa*, n. g., with n. spp. *filiformis* and *flava*, *id. t. c.* pp. 340 & 343.

† *Stylamœba sessilis*, n. g. & sp., *id. t. c.* p. 345.

† *Saltonella saltans*, n. g. & sp., *id. t. c.* p. 347.

† *Eikenia rotunda*, n. g. & sp., *id. t. c.* p. 349.

*Pelomyxa viridis*, n. sp., from Madras, BOURNE, Q. J. Micr. Soc. xxxii, p. 357, pl. xxviii.

*Hyalodiscus lomnickii*, n. sp., JAWOROWSKI, Kosmos, xvi, p. 281, pl. ii A (German résumé, p. 294).

## Order 2. TESTACEA :—

*Diffugia bicuspidata*, n. sp., RHUMBLER, Z. wiss. Zool. lii, p. 546, pl. xxxii, fig. 10.

*Hyalosphenia punctata*, n. sp., PENARD, Arch. Sci. Nat. xxvi, p. 139.

*Quadrula globulosa*, n. sp., *id. t. c.* p. 141.

*Campascus triquetur*, n. sp., *id. t. c.* p. 147.

## Class 5.—HELIOZOA.

† *Sarella diplophrys*, n. g. & sp., FRENZEL, Arch. mikr. Anat. xxxviii, pl. i, fig. 5.

† *Pythelios viridis*, n. g. & sp., *id. t. c.* fig. 6.

*Acanthocystis lemani*, n. sp., PENARD, Arch. Sci. Nat. xxvi, p. 152.

† *Mastigophrys radians*, n. g. & sp., FRENZEL, Z. wiss. Zool. liii, p. 352.



## Class 6.—RETICULARIA.

## Subclass A.—IMPERFORATA.

## Order 3. MILIOLIDEA:—

*Nubecularia depressa* and *N. nodulosa*, n. spp., from the Gault of Folkestone, CHAPMAN, J. R. Micr. Soc. 1891, p. 572, pl. ix.

*Biloculina undulata*, n. sp., *id. t. c.* p. 573, pl. ix.

*Biloculina rixatoria*, n. sp., FRANZENAU, Term. füzetek. xiii, p. 165, pl. ii, fig. 1.

*Miliolina bujturensis*, *M. apposita*, *M. lauta*, *M. retusa*, n. spp., *id. t. c.* pp. 167–169, pl. ii, figs. 2–5.

## Order 4. LITUOLIDEA:—

*Cyclammina lituus*, n. sp., from Japan, NAUMANN & NEUMAYR, Denk. Ak. Wien. lvii, p. 26, pl. v, fig. 7.

## Class 7.—RADIOLARIA.

*Dictyomitra regularis*, *D. conulus*, n. spp. (Bohemian), PERNER, SB. böhm. Ges. 1891, p. 265, pl. x, figs. 2 & 3.

*Cenosphaera artesiaca*, n. sp., *id. t. c.* p. 266, pl. x, fig. 4.

*Lithocyclia discus*, n. sp., *id. t. c.* p. 266, pl. x, fig. 5.

*Thecosphaera spongiarum*, n. sp., *id. t. c.* p. 267, pl. x, fig. 6.

*Acrosphaera hirsuta*, n. sp., *id. t. c.* p. 267, pl. x, fig. 8.

*Druppula convoluta*, n. sp., *id. t. c.* p. 268, pl. x, fig. 9.

*Porodiscus glauconitarum*, n. sp., *id. t. c.* p. 269, pl. x, fig. 11.

† *Microleptos*, n. g., ISSEL, Ann. Mus. Genov. p. 104, pl. vi.

† *Euchitonia pantanelli*, n. sp., *id. t. c.* p. 107, pl. vi, fig. 5.

† *Vagenoarium chuni*, n. g. & sp., from the Atlantic, BORGERT, Z. wiss. Zool. li, p. 675.

## B.—CORTICATA.

## Class 1.—SPOROZOA.

## Subclass 1.—GREGARINIDEA.

† *Polyrabdina*, n. g., to include *Gregarina spionis*, Köll., and others; MINGAZZINI, Atti [Rend.] Acc. Rom. vii, p. 229.

† *Esarabdina synaptæ*, n. g. & sp., *id. t. c.* p. 232.

† *Nematoides fusiformis*, n. g. & sp., *id. t. c.* p. 233.

*Urospora longicauda*, n. sp., *id. t. c.* p. 233.

† *Pachysoma*, n. g., to include *Gregarina sipunculi*, Köll.; *id. t. c.* p. 234.

*Cytomorpha diazonæ*, n. g. & sp., *id. t. c.* p. 469.

† *Lecudina*, n. g., to include *Gregarina pellucida*, Köll., and *L. leuckartii*, n. sp., *id. t. c.* p. 469.

† *Kollikeria stanocephali*, n. g. & sp., *id. t. c.* p. 470.

†*Lobianchella beloneides*, n. g. & sp., *id. t. c.* p. 471.

✓*Ophisidina*, n. g., with n. spp. *elongata*, *hæckelii*, *heterocephala*, *disco-celidis*; *id. t. c.* pp. 471-474.

†*Lankesteria*, n. g., to receive *Monocystis ascidia*, Lankester; *id. t. c.* p. 407.

†*Pleurozyga*, n. g., with n. spp. *distapliae* and *bütschlii*; *id. t. c.* p. 412.

†*Anchorina*, n. g., to receive *Gregarina sagitta*, Leuck.; *id. t. c.* p. 413.

†*Cystobia schneideri*, n. g. & sp., *id. t. c.* p. 318.

### Subclass 2.—COCCIDIIDEA.

†*Glugea microspora*, n. g. & sp., THÉLOHAN, C.R. cxii, p. 170.

### Subclass 3.—MYXOSPORIDEA.

*Myxosporidium mugilis*, *M. merlucii*, *M. congri*, n. spp., PERUGIA, Boll. scient. xiii, pp. 23 & 24.

### Class 2.—FLAGELLATA.

#### Subclass 1.—LISSOFLAGELLATA.

*Tryphomonas danilewskyi*, n. sp., LABBÉ, Bull. Soc. Z. Fr. xvi, p. 229.

#### Subclass 2.—CHOANOFLAGELLATA.

†*Diplosiga socialis*, n. g. & sp., FRENZEL, Z. wiss. Zool. liii, p. 354.

*Monosiga lacustris*, *M. filicaulis*, n. spp., STOKES, J. R. Micr. Soc. 1891, p. 697, pl. x, figs. 1 & 2.

*Salpingoeca brunnea*, n. sp., *id. t. c.* p. 698, pl. x, fig. 3.

### Class 5.—CILIATA.

#### Order 1. PERITRICHIA :—

*Strombidinopsis similis*, n. sp., STOKES, J. R. Micr. Soc. 1891, p. 699, pl. xx, fig. 4.

#### Order 3. HOLOTRICHIA :—

*Frontonia marina*, n. sp., FABRE-DOMERGUE, Ann. Micrograph. iii, p. 212.

*Plagiopyla hatchi*, n. sp., STOKES, J. R. Micr. Soc. 1891, p. 698, pl. x, fig. 4.

#### Order 4. HYPOTRICHIA :—

†*Trichotaxis stagnatilis*, n. g. & sp., STOKES, J. R. Micr. Soc. 1891, p. 701, pl. x, fig. 9.

*Oxytricha setigera*, *O. ludibunda*, n. spp., *id. t. c.* p. 701, pl. x, figs. 10 & 11.

*Histris sphagi*, *H. vorax*, n. spp., *id. t. c.* p. 702, pl. x, figs. 12-14.

*Chelodon habiatus*, n. sp., *id. t. c.* p. 700, pl. x, pl. 6.

*Urostyla elongata*, *U. fulva*, n. spp., *id. t. c.* p. 700, figs. 7 & 8.

*Conchophthirius metschnikoffi*, n. sp., CERTES, Mem. Soc. Zool. Fr. iv.

↓ *Odontochlamys gouraudi*, n. g. & sp., *id. t. c.*

#### Class 6.—ACINETARIA.

##### Order 1. SUCTORIA :—

↓ *Suctorella ciliata*, n. g. & sp., FRENZEL, Z. wiss. Zool. liii, p. 355.

*Acineta equalis*, *A. pyriformis*, n. spp., STOKES, J. R. Micr. Soc. 1891, p. 703, pl. x, figs. 15 & 16.

*Hemiophrya dalyelli*, n. sp., HOLT, Ann. N. H. (6) viii, p. 182, pl. xi.

#### INCERTÆ SEDIS.

↓ *Peitiada mirabilis*, n. g. & sp., FRENZEL, Z. wiss. Zool. liii, p. 357, allied to the Suctoria. Bilaterally symmetrical.

↓ *Microhydrella tentaculata*, n. g. & sp., *id. t. c.* p. 358. Intermediate between *Ciliata* and Suctoria.

↓ † *Chatetopsis*, n. g. for *C. crinita*, n. foss., Jurassic, Japan, NAUMANN & NEUMAYR, Denk. Ak. Wien, lvii, p. 26, pl. v, fig. 7. (? *Cœlenterata*.)

† *Convexastraea orientalis*, n. foss., *id. t. c.* p. 30, pl. v, fig. 6. (? *Cœlenterata*.)

*Salinella salve* (n. g. & sp., FRENZEL), cf. VERMES, p. 50.

↓ *Leidyonella cordubensis*, n. g. & sp., *id. Arch. mikr. Anat.* xxxviii, p. 301. One of the *Trichonymphidæ*, found parasitic on *Eutermes inquilinus*.



# INDEX TO NAMES

## OF

### NEW OR NOT PREVIOUSLY RECORDED GENERA AND SUBGENERA

#### MENTIONED IN VOLUME XXVIII,

INCLUDING NEW NAMES FOR GENERA PREVIOUSLY ESTABLISHED.\*

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| <p>Abacola, <i>Edwards</i>, Crust. 18<br/> Abacopercus, <i>Ganglbauer</i>, Ins. 88<br/> Abichia, <i>Gemmellaro</i>, Moll. 53<br/> Abrodiæta, <i>Brunner</i>, Ins. 300<br/> Abrolophus, <i>Berlese</i>, Arachn. 20<br/> Abrotocrinus, <i>Miller and Gurley</i>,<br/> Ech. 80<br/> Acantheis, <i>Thorell</i>, Arachn. 16<br/> Acanthonycha, <i>Jacoby</i>, Ins. 157<br/> Acanthopoma, <i>Lütken</i>, Pisces 26<br/> Acarabus, <i>Semenow</i>, Ins. 88<br/> Acauloplax, <i>Karsch</i>, Ins. 300<br/> Acherus, <i>Roelofs</i>, Ins. 141<br/> Achlysictis, <i>Ameghino</i>, Mamm. 28<br/> Achorolophus, <i>Berlese</i>, Arachn. 20<br/> Achrostus, <i>Fairmaire</i>, Ins. 131<br/> Aconœmys, <i>Ameghino</i>, Mamm. 32<br/> Acotulus, <i>Reitter</i>, Ins. 131<br/> Acrobunus, <i>Thorell</i>, Arachn. 18<br/> Acrodonta, <i>Redtenbacher</i>, Ins. 300<br/> Acronacantha, <i>Wulp</i>, Ins. 269<br/> Actinodictya, <i>Hall</i>, Spong. 25<br/> Actiornis, <i>Lydekker</i>, Aves 44</p> | <p>Acystipoda, <i>Röber</i>, Ins. 201<br/> Adapantus, <i>Karsch</i>, Ins. 300<br/> Adelaida, <i>Blackburn</i>, Ins. 109<br/> Adenes, <i>Karsch</i>, Ins. 300<br/> Adianthus, <i>Ameghino</i>, Mamm. 39<br/> Adonicus, <i>Fairmaire</i>, Ins. 131<br/> Adrianites, <i>Gemmellaro</i>, Moll. 53<br/> Adulis, <i>Ragonot</i>, Ins. 245<br/> Ædua, <i>Sauvage</i>, Pisces 34<br/> Ægialornis, <i>Lydekker</i>, Aves 39<br/> Ægisthus, <i>Giesbrecht</i>, Crust. 18<br/> Ænictosoma, <i>Schaufuss</i>, Ins. 82<br/> Æromyza, <i>Forel</i>, Ins. 180<br/> Æsiocrinus, <i>Miller and Gurley</i>,<br/> Ech. 81<br/> Æthinodes, <i>Blackburn</i>, Ins. 104<br/> Æthiomærus, <i>Redtenbacher</i>, Ins. 300<br/> Aganaster, <i>Miller and Gurley</i>, Ech.<br/> 73<br/> Agathiceras, <i>Gemmellaro</i>, Moll. 53<br/> Agaura, <i>Brunner</i>, Ins. 300<br/> Agennis, <i>Brunner</i>, Ins. 300<br/> Aglossodes, <i>Ragonot</i>, Ins. 245</p> |
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\* These are 1399 in number, and are distributed as follows:—*Mammalia*, 125; *Aves*, 61; *Reptilia* and *Batrachia*, 16; *Pisces*, 38; *Tunicata*, 5; *Mollusca*, 144; *Brachiopoda*, 2; *Polyzoa*, 1; *Crustacea*, 37; *Arachnida*, 69; *Myriopoda*, 7; *Insecta*, 765; *Echinodermata*, 43; *Vermes*, 37; *Cœlenterata*, 6; *Spongiæ*, 12; *Protozoa*, 31. In 1883, 1884, 1885 (the volumes in which the totals were last stated), the numbers were respectively 1015, 1033, and 1066. The great increase in the present year is apparently in large part due to the very numerous names proposed in some divisions for fossils. There is, however, an increase of upwards of 100 in the *Insecta*, and this is not palæontological.

- Agnapha, *Brunner*, Ins. 300  
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 Agryphia, *Saalmüller*, Ins. 223  
 Ahernes, *Reitter*, Ins. 111  
 Alaotra, *Duvivier*, Ins. 157  
 Alcaëorrhynchus, *Bergroth*, Ins. 276  
 Alcimocoris, *Bergroth*, Ins. 276  
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 Amphinasua, *Moreno and Mercerat*, Mamm. 27  
 Amphipelargus, *Lydekker*, Aves 42  
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 Anaca, *Bergroth*, Ins. 276  
 Anadenulus, *Cockerell*, Moll. 62  
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 Ananteris, *Thorell*, Arachn. 7  
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 Anelytra, *Redtenbacher*, Ins. 300  
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 Anthonomopsis, *Dietz*, Ins. 142  
 Anthonomorphus, *Dietz*, Ins. 142  
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*Astrapodon*, *Ameghino*, Mamm. 39  
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*Atomopteryx*, *Walsingham*, Ins. 261  
*Atopos*, *Simroth*, Moll. 69  
*Atrophopoda*, *Townsend*, Ins. 269  
*Auchenodes*, *Horvath*, Ins. 280  
*Audaniella*, *Sars*, Crust. 16  
*Audaniopsis*, *Sars*, Crust. 16  
*Aulorhamphus*, *de Zigno*, Pisces 20  
*Aurelius*, *Kuvert*, Ins. 110  
*Austrochloritis*, *Pilsbry*, Moll. 63  
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*Auximobasis*, *Walsingham*, Ins. 255  
  
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*Balanocephalus*, *Kennel*, Verm. 40  
*Balassogloa*, *Semenow*, Ins. 135  
*Baliopygus*, *Schulze*, Rept. 20  
*Baniura*, *Ragonot*, Ins. 245  
*Barbaroscardia*, *Walsingham*, Ins. 255  
*Barombia*, *Karsch*, Ins. 310  
*Barotheus*, *Bates*, Ins. 117  
*Barychilina*, *Ulrich*, Crust. 17  
*Barycistela*, *Blackburn*, Ins. 135  
*Baryprostha*, *Karsch*, Ins. 301  
*Baryxenus*, *Bates*, Ins. 117  
*Bathyclupea*, *Alcock*, Pisces 31  
*Bathydexia*, *Wulp*, Ins. 269  
*Bathysoma*, *Davis*, Pisces 15  
*Bathytoma*, *Harris and Burrows*, Moll. 74  
*Bauxia*, *Caziot*, Moll. 87  
*Bergia*, *Steindachner*, Pisces 28  
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*Bernardia*, *Ashmead*, Ins. 288  
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*Blapidurus*, *Fairmaire*, Ins. 131  
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*Boliscus*, *Thorell*, Arachn. 15  
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*Bracharthron*, *Hampson*, Ins. 234  
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*Brachycryptus*, *Quedenfeldt*, Ins. 135  
*Brachymetopa*, *Redtenbacher*, Ins. 301  
*Bradicardia*, *Loriol*, Moll. 109  
  
*Bradyrhynchus*, *Sharp*, Ins. 144  
*Brenskea*, *Reitter*, Ins. 111  
*Breynella*, *Gregory*, Ech. 50  
*Brixioidea*, *Kirby*, Ins. 284  
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*Brontornis*, *Moreno and Mercerat*, Aves, 44  
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*Caccorhinus*, *Sharp*, Ins. 152  
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*Cacochromus*, *Sharp*, Ins. 144  
*Cacomorphocerus*, *Schaufuss*, Ins. 82  
*Callianella*, *Newton*, Moll. 86  
*Calliphron*, *Jacoby*, Ins. 158  
*Callipyris*, *Meyrick*, Ins. 224  
*Callixena*, *Saalmüller*, Ins. 225  
*Callizonella*, *Apstein*, Verm. 27  
*Callomenus*, *Ameghino*, Mamm. 57  
*Calocerus*, *Fauvel*, Ins. 97  
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*Calopsyra*, *Brunner*, Ins. 301  
*Calvertius*, *Sharp*, Ins. 144  
*Calybium*, *Morlet*, Moll. 91  
*Calycaster*, *Perrier*, Ech. 74  
*Calyce*, *Champion*, Ins. 138  
*Calycobathra*, *Meyrick*, Ins. 256  
*Calyptogena*, *Dall*, Moll. 106  
*Calyptrotis*, *Meyrick*, Ins. 256  
*Camarona*, *Wulp*, Ins. 270  
*Campylophlebia*, *MacLachlan*, Ins. 292  
*Caudezoides*, *Duvivier*, Ins. 159  
*Caudonopsis*, *Vávra*, Crust. 17  
*Cannabateomys*, cf. *Kannabateomys*  
*Caponina*, *Simon*, Arachn. 10  
*Carphoxera*, *Riley*, Ins. 238  
*Carponycteris*, *Lydekker*, Mamm. 23  
*Carterophonus*, *Ganglbauer*, Ins. 89  
*Cassidula*, *Weise*, Ins. 159  
*Cassius*, *Kuvert*, Ins. 110  
*Castalina*, *Jhering*, Moll. 105  
*Castelnaudia*, *Tschitschérine*, Ins. 89  
*Catablemella*, *Eigenmann*, Pisces 27  
*Catarhynchus*, *Desbrochers*, Ins. 144  
*Catocrocis*, *Ragonot*, Ins. 246  
*Catonyx*, *Ameghino*, Mamm. 51  
*Caulopsis*, *Redtenbacher*, Ins. 301  
*Centromedon*, *Sars*, Crust. 16  
*Cephalophonus*, *Ganglbauer*, Ins. 90  
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- Ceraia, *Brunner*, Ins. 301  
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## ERRATA.

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MAMMALIA, p. 32. Line 7 from bottom, transfer the n. spp. of *Perimys* to the paragraph relating to the genus on p. 33, line 6 from top.

MAMMALIA, p. 41. Line 11 from top, for "*vallidus*," read "*validus*."

MAMMALIA, p. 48. Transfer the paragraphs referring to *Saurocetes*, *Pontoplanodes*, and *Saurodelphis* from *Delphinidae* to *Platanistidae*.

INSECTA, p. 116, line 7 from bottom, for "sp.," read "g."

INSECTA, p. 127, line 14 from bottom, for "*Omphalicus*," read "*Omphalius*."

INSECTA, p. 165, line 9 from top, for "*Odiontionycha*," read "*Odontionycha*."

INSECTA, p. 217, line 4 from bottom, for "*E. bifascia*," &c., read "*Euproctis bifascia*," &c.

INSECTA, p. 251, line 1, for "*Raselioides*," read "*Raselioides*."

INSECTA, p. 291, line 7 from top, for "Zetterstedt and Sundwall," read "Zetterstedt and Sundevall."

ECHINODERMATA, p. 15. From the title RUSSO (4) delete the asterisk, and instead of "pp. P," read "pp. 293-329."

ECHINODERMATA, line 18 from top, for "*Trachpatagus*," read "*Trachypatagus*."

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